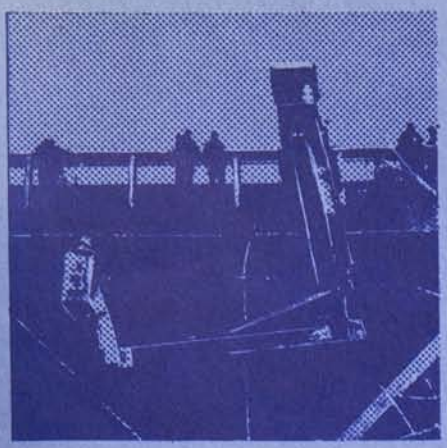

ANNUAL REPORT

MASSACHUSETTS DEPARTMENT of PUBLIC WORKS

FISCAL YEAR · JULY 1, 1974 to JUNE 30, 1975

ANNUAL REPORT

JULY 1, 1974 THROUGH JUNE 30, 1975

COMMONWEALTH of MASSACHUSETTS

MICHAEL S. DUKAKIS
Governor

FREDERICK P. SALVUCCI
Secretary of
Transportation & Construction

DEPARTMENT OF PUBLIC WORKS

JOHN J. CARROLL
Commissioner

ROBERT T. TIERNEY
Chief Engineer

The Commonwealth of Massachusetts
Executive Office of Transportation and Construction
Department of Public Works
Office of the Commissioner
100 Nashua Street, Boston 02114

November 21, 1975

His Excellency Governor Michael S. Dukakis,
Frederick P. Salvucci,
Secretary of Transportation and Construction
and the Great and General Court of the
Commonwealth of Massachusetts

Gentlemen:

I am transmitting herewith our Department's Annual Report for the fiscal year ended June 30, 1975. I am pleased to note that during this period, the Department advertised some $220,000,000 in highway construction contracts, more than any other previous fiscal year.

Sincerely,

JOHN J. CARROLL
COMMISSIONER

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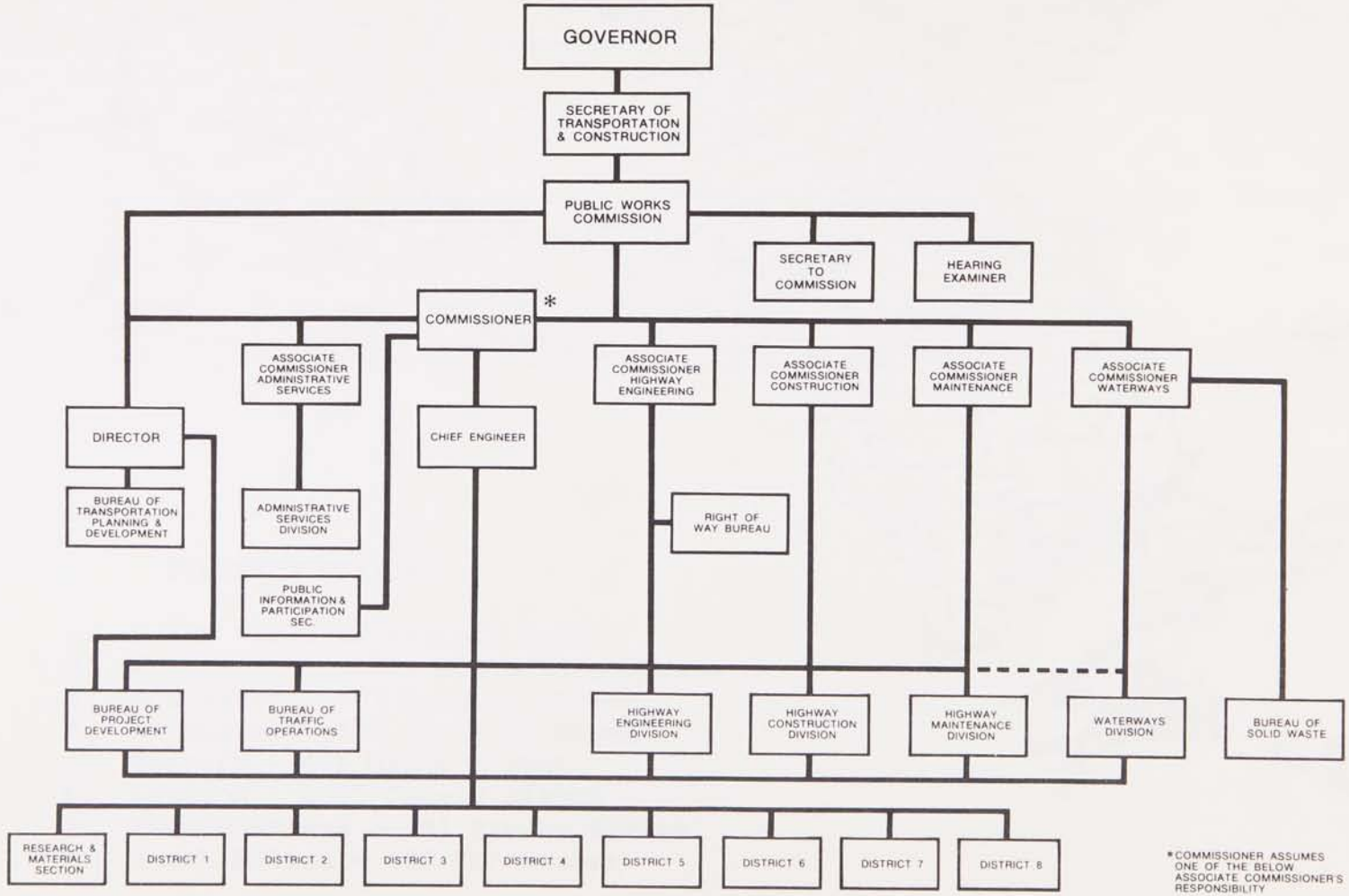
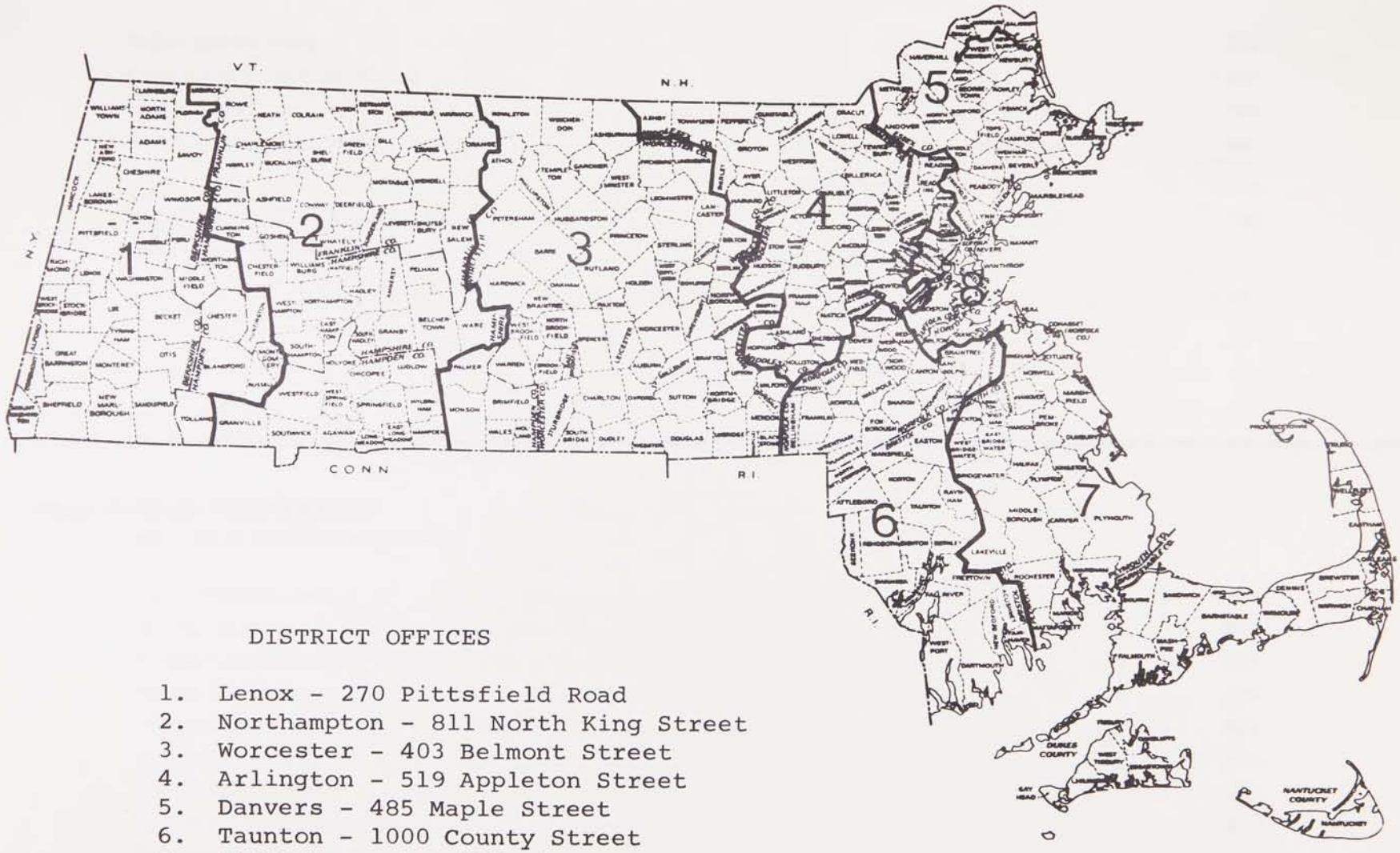
Massachusetts Department of Public Works



MASS. D.P.W. DISTRICT BOUNDARIES



DISTRICT OFFICES

1. Lenox - 270 Pittsfield Road
2. Northampton - 811 North King Street
3. Worcester - 403 Belmont Street
4. Arlington - 519 Appleton Street
5. Danvers - 485 Maple Street
6. Taunton - 1000 County Street
7. Middleborough - 151 Pierce Street
8. South Boston - 400 "D" Street

Number of Employees in the Massachusetts Department of Public Works (1975)

Functional Distribution

Policy and Planning	212
Construction and Engineering	1,620
Maintenance	2,327
Administrative Support and Overhead	400
Sub-total	4,559
Waterways Engineering and Administration	50
Solid Waste Planning and Administration	8
Total	4,617

Geographical Distribution

(excludes Waterways & Solid Waste Divisions)

Boston Headquarters	1,162
District 1 (Lenox)	227
District 2 (Northampton)	354
District 3 (Worcester)	439
District 4 (Arlington)	453
District 5 (Danvers)	394
District 6 (Taunton)	633
District.7 (Middleborough)	440
District 8 (Boston)	255
Wellesley (Maintenance and Sign Shop)	135
Wellesley (Research and Materials)	67
Total	4,559

SUMMARY OF DPW

HIGHWAY CONSTRUCTION AND MAINTENANCE

CALENDER YEAR	ACCELERATED HIGHWAY PROGRAM ACTS	$ VALUE OF CONST. PROJECTS ADV.	# LANE MILES STATE HWYS. MAINTAINED
1960	$ 86,000,000	$ 75,000,000	7049
1961	90,000,000	73,000,000	7243
1962	110,000,000	79,000,000	7522
1963	125,000,000	86,000,000	8133
1964		73,000,000	8300
1965	320,000,000	62,000,000	8614
1966		90,000,000	8443
1967	300,000,000	101,000,000	8754
1968		63,000,000	8936
1969	260,000,000	173,000,000	9266
1970		63,000,000	9395
1971		79,000,000	9530
1972	561,000,000	143,000,000	9780
1973		92,000,000	10550
1974		136,000,000	11438
1975		200,000,000 est.	11700 est.

5 YEAR SUMMARY (AVERAGE/YEAR)

	CONSTRUCTION PROJECTS ADV. ($)	# LANE MILES MAINTAINED
1961-1965	75 million	8,000
1966-1970	100 million	9,000
1971-1975	130 million	10,500

PROJECTS ADVERTISED

(Fiscal Year 1975)

July	1974	$ 3,118,790
August	1974	18,413,159
September	1974	4,513,223
October	1974	23,959,170
November	1974	17,219,583
December	1974	3,182,741
January	1975	4,749,233
February	1975	3,948,071
March	1975	10,766,489
April	1975	6,739,636
May	1975	93,301,165
June	1975	30,723,821
	TOTAL	$ 220,622,081

MASSACHUSETTS FEDERAL HIGHWAY ADMINISTRATION
APPORTIONMENTS

Category	Fiscal Year 1974	Fiscal Year 1975	Fiscal Year 1976
Interstate	76,871,399.	91,864,780.29	99,094,511.39
Primary Rural	6,878,393.	6,878,393.	7,702,920.
Secondary Rural	3,203,856.	3,319,883.	3,710,370.
Urban System	23,166,375.	23,697,608.	23,760,384.
Urban	8,939,920.	9,516,340.	9,248,193.
Priority Primary	1,982,718.	4,006,315.	5,952,685.
Hwy. Planning Research (1½%)	1,843,286.	2,084,128.	2,117,850.
MTA Planning (½%)	804,091.	906,375.	922,320.
High Hazard Locations	1,083,646.	1,642,234.	1,626,225.
Elim. Rds. & Obstacles	541,824.	1,642,234.	1,626,225.
Safer Rds. Demonstration	1,099,411.	2,198,820.	2,102,907.
Rail-Hwy. Crossings	490,765.	1,487,472.	1,294,977.
Pavement Marking Fund	152,492.	462,191.	0.
Off System Roads	0.	0.	1,349,555.
TOTAL	$127,058,176.	$149,706,773.29	$160,509,122.39

BUREAU OF TRANSPORTATION PLANNING & DEVELOPMENT

The Bureau of Transportation Planning and Development is charged by the Legislature with the primary responsibility for transportation planning within the Commonwealth and with coordinating the transportation related efforts of other State agencies.

Since its formation in 1964 as part of the State's response to the 3-C process requirement of the 1962 Federal Highway Act (the call for comprehensive, cooperative and continuing planning in urbanized areas), the BTP&D's role has changed significantly. While the Bureau has retained its functions of data management and technical analysis, it has shifted its emphasis to the development and support of a policy-oriented, decentralized and participatory planning process, involving consideration of a broad range of impacts and improved interagency coordination. This evolution of BTP&D's role is part of the major reorganization of the transportation planning and decision making process within the State - an effort aimed at revitalizing the 3-C process so as to meet Federal requirements in spirit as well as in letter of the law, and to achieve the State's goal of cooperative development of a balanced transportation system.

To document the 3-C planning process, Federal law has required each State to produce an "Action Plan". The Director and staff members of BTP&D played key roles in the development of the Massachusetts Action Plan, which was approved in the past fiscal year and is now being implemented.

The continuing implementation of the 3-C process is focused upon the thirteen regional planning jurisdictions that encompass all 351 communities in the Commonwealth. Within each of these regions, there has been formed a transportation policy advisory group (TPAG). Decisions for transportation improvements are made by the statutory State agencies only after full consultation with these TPAGs. The Regional Planning Agency (RPA), the professional planning organization for each region, provides staff support to the TPAG. The regional liaison section of BTP&D coordinates the technical analysis and support functions of BTP&D with the efforts of the RPA staff. This coordination is reflected in the preparation and implementation of "unified work programs" for each region. Coordination of the planning activities of the several agencies involved in such areas as land use, air quality and economic development is handled by the Bureau's interagency liaison section, working with the Office of State Planning.

Technical analysis and data management activities of the Bureau are carried on through supervision of consultant contracts, as well as through in-house work. The primary activities in this area are:

- on-going data collection and data management
- special Statewide planning studies, area studies and project studies
- on-going program development activities
- research

The continuing data collection and management activities include the updating of physical inventories and travel inventories. Field operations for the completion of the road inventory program were completed in 1975. In a related activity, the updating of the 1968 functional classification system, used for need determination, financing of projects, and assignment of jurisdictional responsibility, was completed.

A major responsibility of the Bureau is to translate raw traffic count data into refined traffic movement estimates for design purposes. Travel (or operations) inventory updating include the traffic count program, truck surveys, origin-destination surveys, and the publishing of the 1972 Traffic Volume Report.

Statewide studies which either started or continued this year included studies of staggered work hours, bicycle routes, scenic roads and railroad network and right-of-way evaluation. Specific project studies included an economic evaluation of the Fore River Bridge. Area-wide studies included the Springfield Community Impact Study and the completion of the Planning Study Designs for the Montachusett and Berkshire regions.

Continuing program development activities include the preparation of various fiscal studies, the design and start of implementation of a project information system and the start of the development of a Statewide transportation capital improvement program.

The immediate priority of the Bureau is the fine-tuning of the relationship among the RPAs, TPAGs and itself; specifically dealing with the question of how local, regional and State priorities are combined into a work program.

Additionally, BTP&D faces the challenge of activating wide and effective community participation in the TPAG. In adapting to the changes in emphasis of its responsibilities, BTP&D seeks to maintain the momentum it has achieved towards its goal of initiating planning in a decentralized and open process, rather than only responding to requests for technical information.

In this connection, a major responsibility and accomplishment of the Bureau in 1975 was the reorientation of state and regional planning activities to integrate inter-desciplinary programs on a comprehensive regional and corridor planning study basis (Action Plan) with multi-modal transportation as an element in a total process including land use, economic, social and environmental factors. The reorientation was achieved in close co-operation with the Office of State Planning and produced (1) a general regional planning study outline for use by all 3C agencies in reshaping regional unified work programs and (2) two specific regional planning study designs and work programs: Berkshire (BCRPC) and Montachusett (MRPC). For other regions, it is anticipated that, within the regional planning study format, a corridor planning study emphasis will produce a series of issue-oriented studies which can be aggregated as areawide studies.

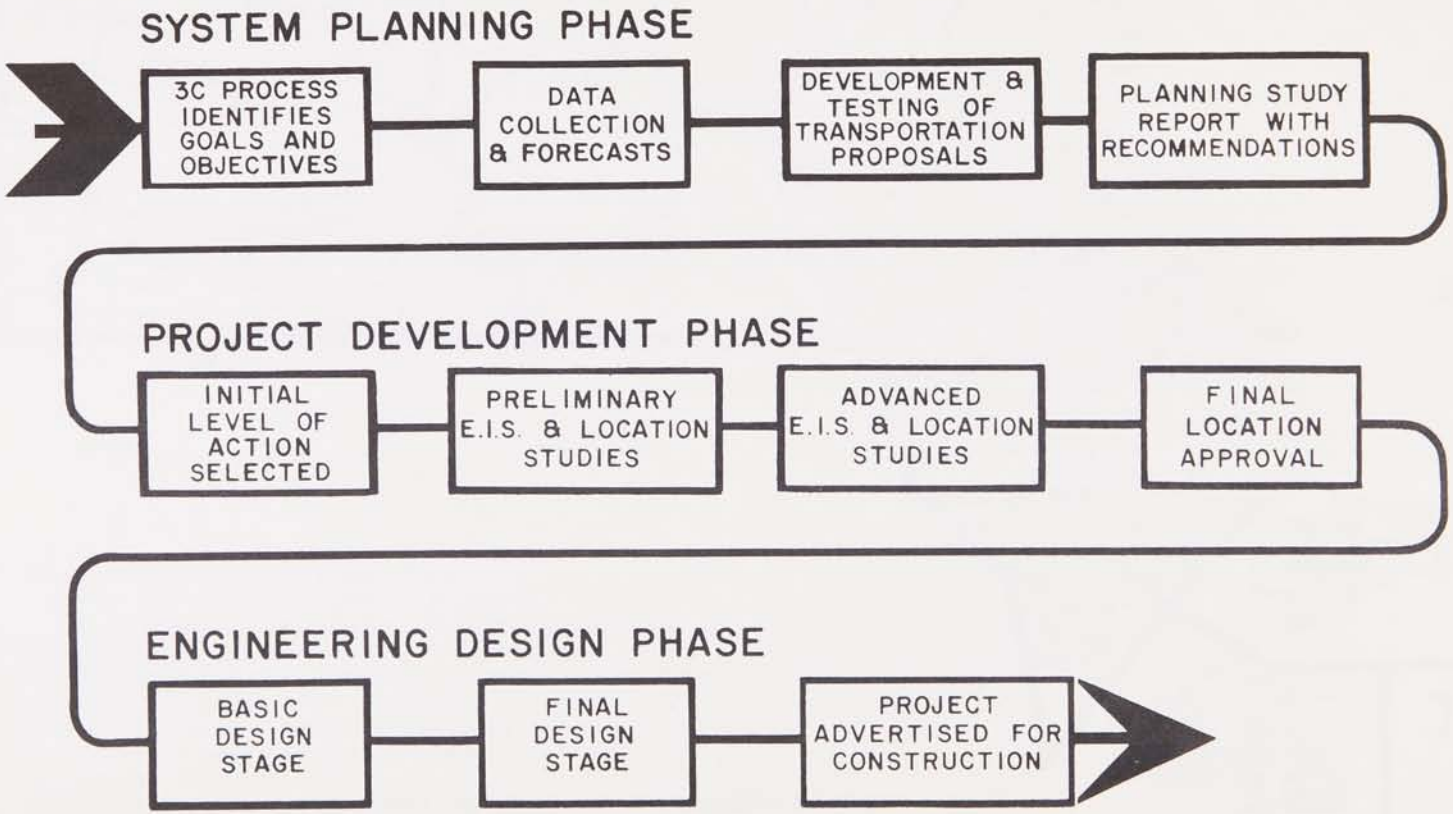
The major thrust of the reorientation is integration of a variety of federally-funded programs (DOT-3C, EPA-208, HUD-701, EDA, etc.) and state counterpart activities to eliminate duplication and conflict and, thereby, improve productivity and utility despite the reduced commitment of personnel and resources required by current budget constraints.

The major achievements of the BTP&D during 1975 are summarized below:

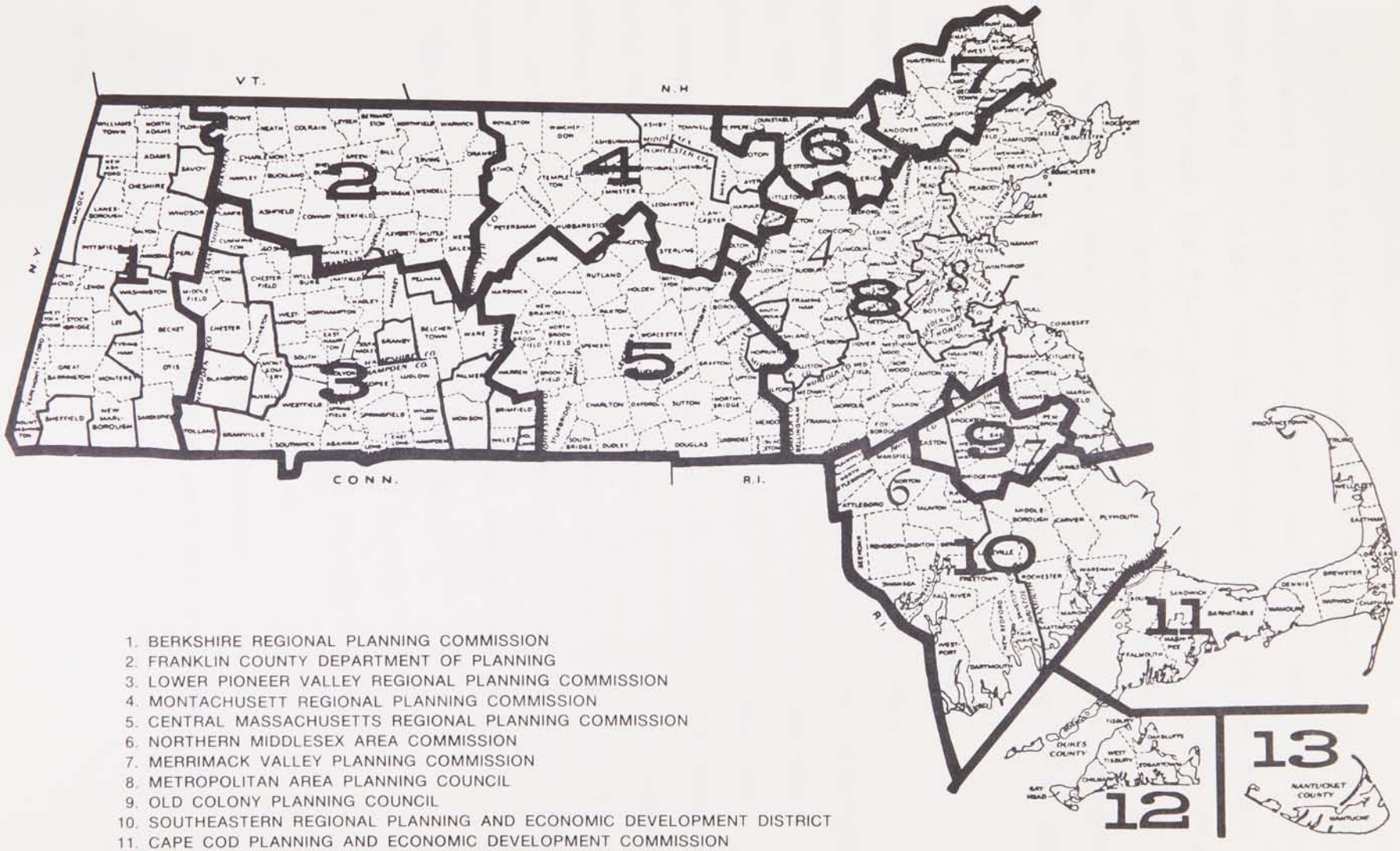
1. The development of a preliminary draft of Highway Priorities.
2. The development of a Project Information System.
3. Significant improvements to the statewide traffic counting programs.
4. Status Report on Transportation Planning.
5. Regional Planning Studies.
6. Corridor Planning Studies.
7. Bike Path Plans and Programs.
8. New map series.
9. Regional and Statewide networks.
10. Technical Guidelines.
11. Completed the Fore River Bridge economic analysis study.
12. Completed the land use mapping and initated development of a forecasting process for the entire state.
13. Made substantial progress in re-aligning the Federal-Aid highway system based upon an approved functional classification plan.

14. Made substantial progress in coding and keypunching highway inventory data and planning the data in computer files.
15. Participated actively in programs being established by the newly formed Office of State Planning to integrate state agency planning on a comprehensive basis including RPS (5).
16. Completed various U.S. DOT mandated data collection efforts.

STEPS IN THE DEVELOPMENT OF A TRANSPORTATION PROJECT IN MASSACHUSETTS



MASSACHUSETTS REGIONAL PLANNING AGENCIES



1. BERKSHIRE REGIONAL PLANNING COMMISSION
2. FRANKLIN COUNTY DEPARTMENT OF PLANNING
3. LOWER PIONEER VALLEY REGIONAL PLANNING COMMISSION
4. MONTACHUSETT REGIONAL PLANNING COMMISSION
5. CENTRAL MASSACHUSETTS REGIONAL PLANNING COMMISSION
6. NORTHERN MIDDLESEX AREA COMMISSION
7. MERRIMACK VALLEY PLANNING COMMISSION
8. METROPOLITAN AREA PLANNING COUNCIL
9. OLD COLONY PLANNING COUNCIL
10. SOUTHEASTERN REGIONAL PLANNING AND ECONOMIC DEVELOPMENT DISTRICT
11. CAPE COD PLANNING AND ECONOMIC DEVELOPMENT COMMISSION
12. DUKES COUNTY PLANNING AND ECONOMIC DEVELOPMENT COMMISSION
13. NANTUCKET COUNTY REGIONAL PLANNING COMMISSION

BUREAU OF PROJECT DEVELOPMENT

The "Project Development phase" of transportation studies commences when the "Systems Planning phase" has been completed. In other words a project can be developed after it has been justified through the "3-C" process; a continuing, cooperative and comprehensive planning effort. This System Planning phase is total transportation planning within the Commonwealth in cooperation with other state agencies and regional planning agencies.

Project Development is responsible for the study of transportation alternatives within a corridor location. Continuing with the "3-C" process and broad citizen participation, the Bureau develops various alternatives within the corridor. It prepares preliminary plans and profiles and cost estimates, and develops the soci-economic, environmental impacts for each alternative. The end product is a "recommended alternative" with a basic design and environmental impact statement. After a Public Hearing the project is either acceptable for further design or it is recycled for further consideration.

The Bureau has four major sections:

(1) Location and Survey

(2) Geodetic and Photogrammetric

(3) Environmental

(4) Special Projects

The joint effort of the four sections is responsible for completing the project development phase of transportation projects.

Geodetic Survey Section

The function of the Geodetic Survey Section of the MDPW is to establish and maintain, horizontal and vertical control within the Commonwealth. The section provides services to municipalities, private surveyors and consultants with control data throughout the year.

Over this past year it has had a continuous program for state-wide recovery of Geodetic Survey markers that is successfully bringing our records up to date.

A program has been implemented to introduce Geodetic Survey methods to district survey personnel to enhance our efficiency within the Department.

Geodetic field crews are continously running control traverse; setting measurements; measuring horizontal angles, slopes and zenith distances; doing field reconniasance; determing differences in elevations and writing the descriptions to aid in the location of control stations.

The office force checks and abstracts the field books; adjusts triangulation, traverse and level data; maintains a control data file of approximately 20,000 positions; and plots control stations on topographical maps by coordinates.

The Section works in close cooperation with the U.S. National Geodetic Survey on surveys within the limits of the Commonwealth, and administers the cooperative mapping project with the U.S. Geological survey; maintains the records of the town line boundaries;

reviews proposed town boundary changes prior to enactment by the legislature; and advises State, County, and Municipal agencies in the planning and adjustment of town line surveys.

At present several in-house computer programs have been developed to resolve Geodetic Survey problems. A series of programs by U.S. National Geodetic have been rewritten, modified and updated by this Section to better suit our needs. One such program to compute plane coordiante traverse adjustments will be used to strengthen our statewide network. Use of these newly developed programs will insure a faster and more efficient method of handling the vast amount of control survey data received daily by the Section.

Survey Section

Although the Survey Section is not one of the more glamorous organizations in the Department, it does perform quite essential service, as it administers all Department survey operations except those of Waterways. These operations are carried out by survey personnel in the eight districts, the personnel consisting of some 24 supervisors and assistants, 65 state parties and 66 private parties, or about 550 men. Survey men are working on projects from pre-design through the final survey of the facilities, providing services without which our highways and bridges could be neither designed nor built.

The Survey Section is gradually acquiring new and better equipment as availability of funds dictates, and has a quantity of equipment such as target sets, automatic levels, theodolites, modern transits with optical plummets and a tackemoeter. Also, it now has three infra-red electronic measuring devices and hopes to acquire one more per year to outfit ultimately all districts. Thirty (30) new hand calculators have also been purchased to aid survey field personnel. Twenty-three (23) new van type vehicles are being procured to replace older and smaller carryalls. These provide twice the storage space of the older trucks and will be able to carry not only personnel and survey equipment but also an increased amount of safety equipment such as signs, cones, elevated flags and so on.

Location Section

Approximately 21 in-house location studies are presently in an active phase for an average of 32 miles of highways, in addition to miscellaneous projects. This section is monitoring consultant contracts for a total worth of $2,750,000 involving nine separate contracts for a distance of 52 miles.

Several employees attended Highway Traffic Noise Abatement workshops and Air Pollution classes. In keeping with efficient and good management techniques, a staff member attended the Leadership and Communication Seminar.

At present, Locations has been assigned the responsibility to study schemes of depressing the Central Artery in the City of Boston. The method of approach is unique since it allows traffic on the Central Artery to continue uninterrupted while construction is underway.

Photogrammetric Section

The Photogrammetric Section is responsible for obtaining and furnishing aerial photography and aerial photogrammetric survey plans for various types of highway studies.

During the year, we initiated aerial consultant contracts for photogrammetric topographic study plans at a scale of 1" = 100' with 2' contours covering 4.18 square miles; orthophoto study plans at a scale of 1" = 100' covering 5.76 square miles; design plans at a scale of 1" = 40' with 2' contours covering 3.019 square miles; design plans with baseline profiles, construction plan and profile tracings and cross-sections, at a scale of 1" = 40' with 2' contours covering an area of 2.97 square miles; and TOPICS design plans at a scale of 1" = 20' with 1' contours covering an area of 0.69 square miles. There were ten (10) projects initiated at a total lump sum fee of $337,613.00.

Aerial mosaics at a scale of 1" = 200', made up of existing area-wide photography, covering an area of 15.39 s square miles at a lump sum fee of $1,790.00 were initiated during the year and enlargements to a scale of 1" = 200' of aera-wide photography were obtained for a total area of 14.64 square miles at a cost of $346.50.

There were numerous visitors and telephone callers seeking both general and specific information about aerial photographic coverage of the State. Many of them were interested in our 1:7200 (1" = 600') statewide photographic coverage.

Frequent requests to loan out aerial photographs were granted to departmental personnel, departmental consultants and other State governmental agencies, and the section furnished about 1700 prints covering about 3800 square miles (2,432,000 acres).

Environmental Section

During the past year seven (7) Draft EIS's were circulated as follows:

1. Route 140, Gardner - Westminister
2. Route 52, Oxford - Auburn
3. Route 25, Wareham - Plymouth - Bourne
4. Route 128, Salem - Peabody Connector, Task "A"
5. Route 6, Dennis - Harwich - Brewster - Orleans
6. Route I-391, Chicopee - Holyoke
7. Route I-495, Taunton - Foxborough - Mansfield - Norton Raynham - Bridgewater

Three (3) Final EIS's were approved during 1975.

1. Amherst - Hadley By-Pass
2. Route 9 @ Speen Street - Natick
3. Route I-190, Worcester - Holden - West Boylston - Sterling Lancaster - Leominster - Fitchburg

Also 220 Environmental Assessment Forms (EAF) for the Department of Public Works were processed through the Environmental Section. The Environmental Section was involved in approximately 25 Environmental Impact Reports (EIR) as a joint participant.

The section also acts as a reviewing agency for EAF's and EIR's submitted to EOEA.

The Environmental Section conducts an inter-agency monthly meeting to discuss environmental issues of mutual concern. This meeting is primarily intended to be project and agency oriented but guest speakers also address pertinent and timely issues.

A monthly meeting is held with District Environmental Engineers and other Engineers on specific subjects, projects and problems.

For the past year the Environmental Section has had a contract with the University of Mass. providing staff support to the Department in preparation of Environmental Impact Statements and 4(f) Statements.

The Environmental staff presently consists of 14 members trained in mathematics, economy, social psychology, architecture and civil engineering. During the past year we have had two In-Service engineering interns. Also, as part of a University-Agency sponsored exchange program with Tufts University we had two students working with our staff. One member of our staff attended two semesters at Tufts University under this cooperative program.

COURSES ATTENDED

Two staff members attended a Water Quality Course sponsored by FHWA and held in Albany, New York during April, 1975.

Two staff members attended an Ecology Course sponsored by FHWA and held in Albany, New York during April, 1975.

Five staff members attended a Noise Course sponsored by NHI and held in Boston, Mass. during May, 1975.

Two staff members attended a course at Bridgewater State College on Land Use Planning.

Also we have had one member actively involved in developing a training course in Community Involvement in Highway Planning and Design for the FHWA and representing the Department as an instructor for the pilot training course.

Effective November 29, 1974, a new issuance of PPM 90-1, published as FHPM 7-7-2, provided improved guidelines in the preparation and processing of EIS's. One of the most important aspects of the guidelines being the definition of a major and non-major action.

The determination of a major action requires the preparation of an EIS or Negative Declaration. The determination of non-major action allows certain types of actions to be excluded from full EIS development.

The requirements of the Action Plan continue to be implemented and documented. The Public participation process has been refined to respond to the Action Plan and also to the new specifications for consultant services that were developed to be consistent with the Action Plan.

The Section is becoming more involved with other divisions in the Department, expanding services to include construction, highway maintenance and traffic operations.

Engineers in the sections have participated in seminars as resource-people; presented speeches to service and industry organizations; have participated as local representatives to Transportation Planning Advisory Groups and appeared before Legislative Committees on MEPA.

Special Projects

The Special Projects Section of the Bureau of Project Development functions in a staff relationship with the other sections in addition to its line function of carrying forward long-range planning alternatives. As described in the 1974 Action Plan, Project Development fills the need to eliminate redundant studies and to narrow alternative options to the most feasible and attainable solutions acceptable for Design and Construction.

During the year, the Special Projects Section negotiated and supervised contracts and studies in such diverse project areas as: bridges (new and reconstructed), carpooling, demolition, fringe parking, joint use of highway and transit facilities, area transportation studies, area parking studies, air quality assessments, acoustic impact studies, highway aesthetics, use of railroad right of way and bicycle paths.

In the field of public relations, the Special Projects Section has been a source of guidance to the student population of our local colleges, various public interest groups and public agencies in current data relation to transportation development plans and completed projects. This activity, during the year involved responses to more than 150 inquiries.

The Special Projects Staff of 6 engineers administered 30 contracts which included negotiations and contract supervision in addition to 35 in-house projects for cities and towns and other agencies.

HIGHWAY ENGINEERING DIVISION

This has been another year of change for the Highway Engineering Division. Highway design is no longer an economical analysis among safe alternate design concepts; although economic considerations are important and safety remains paramount, environmental concerns, community impact and aesthetics all play an increasingly important part in the selection process.

Major expressways on new locations still form a large part of the engineering effort, particularly geared toward completion of the Interstate System. But design emphasis in 1975 is increasingly placed on reconstruction and upgrading of existing facilities - pavement and bridge rebuilding, removal or protection from hazardous objects and the installation of the latest in safety equipment and appurtenances.

Built into our designs are a variety of measures to minimize adverse environmental impacts. Among these are flatter grades to decrease the need for winter salting, drainage systems which carry road water runoff beyond water supplies, ponds and other sites where even the slightest chloride (salt) contamination would be harmful, sedimentation basins to prevent silting of streams, noise barriers to decrease the impact of traffic on schools and residences. Also of growing concern is the impact of highway and bridge improvements on historic areas, of which there are many in our State. Every effort is made by the Highway Engineering Divi-

sion to cooperate with local communities and historical societies to insure that proposed transportation facility improvements do not conflict with historic landmarks. An example of this cooperation is the newly completed section of Route 129 in Wilmington in the area of the historic Middlesex Canal.

Again this year, safety projects are a major product of Highway Engineering; these include pedestrian fences on existing bridges, installation of break-away sign posts and impact cushioning devices at locations of hazardous immovable roadside objects. In addition, the Engineering Division is responding to the tremendous upsurge in bicycle traffic along our highways by providing for separate bicycle paths wherever feasible in our highway designs. The newly completed bicycle path in Martha's Vineyard is illustrative of our flexibility in providing safe facilities for changing trends in transportation.

With the completion of the Interstate System, safety and bridge replacement will undoubtedly be the largest components of the design program.

Bridge Section

The Department of Public Works is the owner of approximately 2400 bridges in the Commonwealth of Massachusetts. They vary in size, type, age and condition, from a stone arch built more than 200 years ago in Ipswich to a mile long structure completed a few years ago spanning the Taunton River.

In addition to the DPW owned bridges, there are 2800 bridges under the ownership of cities and towns.

A total of 491 bridges previously owned by the State's major railroads have been or are in the process of being transferred to the Department by statute. This twenty percent increase in bridges drastically accentuates a growing problem in bridge maintenance and replacement.

The problems relating to bridges have thus become a major concern of the Commonwealth.

During the annual report period extending from July 1, 1974 to June 30, 1975, the Department advertised for bids for construction, re-construction, extensions or rehabilitation of 52 bridges, 5 culverts and 3 walls.

These structures are located in 25 cities and towns throughout the Commonwealth with a total structural cost of $20,953,000 which cost was distributed to the following categories:

Safety Programs	$ 512,000
Urban Systems	2,814,000
Substandard Bridges	843,000
Topics	188,000
Structural Improvements	637,000
Maintenance	162,000
Chapter 90	30,000
State Highway	1,182,000
Federal Aid	14,585,000
	$20,953,000

The major projects which were advertised and bids received during the current year were the following:

I-495 Recon. Chelmsford to Andover-2 bridges-$597,000

I-95 Recon. Boxford-Georgetown-Newbury-Newburyport-$7,976,000 14 bridges-2 culverts

I-190 Leominster-3 bridges and 2 walls $4,151,000

The cities and towns in which the remainder of the bridges for which bids were received are:

Acushnet	$ 30,000	- culvert
Ashland	75,000	
Ayer-Shirley	409,000	
Boston	1,670,000	- 5 bridges
Charlton	44,000	- 2 culverts
Chelsea	33,000	- screening
Holden	67,000	- wall
Littleton	717,000	

Malden	$1,112,000	- 2 bridges
Marlborough	95,000	
Medford	280,000	
Middleborough	63,000	- rail replacement
No. Andover	193,000	
Northfield	71,000	
Taunton	773,000	
Waltham	126,000	
Norwood-Westwood	940,000	
Revere	1,323,000	- 3 bridges
Chicopee	99,000	- 2 bridges
Auburn	26,000	
Leominster	83,000	- 5 bridges

Preliminary engineering design has been initiated for the following major projects:

Worcester	Interstate 190	- 32 bridges
Leominster	Interstate 190	- 9 bridges
Chicopee	Interstate 391	- 12 bridges
Mansfield		
Raynham	Interstate 495	- 9 bridges

The Bridge Section has been involved with the design and checking of shop drawings for various traffic sign contracts. The overhead traffic signs in various locations throughout the State that were designed or design checked by this Section cost over $1,400,000.

The Bridge Section reviews the inspections of testing agencies and the inspection of steel fabrication plants and welding procedures.

Rating of bridges to determine the safe allowable load is one of the tasks of the Bridge Section. During this Annual Report period, 120 bridges have been rated.

Bridge Engineer, John J. Aherne, Jr., hosted a meeting of the American Association of State Highway and Transportation Officials, Region One Bridge Committee, at the Copley Plaza Hotel, on May 22nd and 23rd of this year. At this meeting proposed changes to the Standard Specifications for designing structures were reviewed and voted on.

State Aid for Communities in the Commonwealth has increased dramatically in recent years as shown in the accompanying tabulation. The current major State Aid Highway Programs for Cities and Towns are described below. (For a more complete list, please refer to the Department"s blue booklet, 1975 STATE AID TO MUNICIPALITIES.)

CHAPTER 765-ACTS OF 1972:

I. This Act provided funding for the normal annual State Aid Highway allocations to all municipalities. The Department apportioned $13.5 million for each of Fiscal Years 1975, 1976 and 1977. No matching funds are required of either the municipality or county; however, if either the municipality and/or the county wish to contribute to a project they may do so. These funds have to be used for construction, reconstruction or improvement type projects. They cannot be used for routine maintenance. This program replaces the old Chapter 81 and Chapter 90 Funding Programs, but still remains a "reimbursable" program, except on advertised contract projects where the municipalities has elected to have the Department be the Party-of-the-First Part. Projects can be constructed by Advertisement or by Force Account method. If a municipality has an approved project ready for construction or improvement, Fiscal 1976 and 1977 funds are available.

CHAPTER 497-ACTS OF 1971:

II. This Act provided for a "gas tax" distribution to all municipalities throughout the Commonwealth. These funds are estimated annually on the "Cherry Sheet" by a formula as required by Chapter 497-Acts of 1971, and as amended by Chapter 492-Acts of 1974, with actual corrected amounts distributed later on in the year. The funds have to be used for constructing, maintaining and policing city and town public ways. The Department of Public Works requires that each municipality certify annually that these funds will be used for the above mentioned purposes.

CHAPTER 1140-ACTS OF 1973:

III. This Act provided a local-aid transportation authorization to assist highway, transit and airport activities in cities and towns throughout the Commonwealth.

SECTION 16 provided for a General Fund payment of $35 million directly to the MBTA to defray a portion of the MBTA assessments to the communities that make up said authority.

SECTION 20 provided for a $15 million on highway bond authorization to be used for the construction, reconstruction and resurfacing of local streets to communities outside the MBTA district. These funds were received in the form of a check for highway related projects. The funds must be spent on projects which have received Department approval and must be spent by June 30, 1977.

SECTION 21 provided for a $2.5 million highway bond authorization to the (50) MBTA "fringe" communities to be used and expended in the same manner as non-MBTA municipalities outlined under Section 20 above.

SECTION 22 provided a $25 million direct appropriation for assistance in the operation and maintenance of local streets to communities outside the MBTA district and is intended to reimburse said communities for the cost of highway activities carried out between December 5, 1973 and June 30, 1975. These funds were distributed in the form of a check and must have been appropriated and expended by June, 1975.

CHAPTER 825-ACTS OF 1975:

IV. This Act provided a local-aid transportation authorization to assist highway and transit development in cities and towns throughout the Commonwealth.

SECTION 1 provided for a $20 million apportionment in communities outside the MBTA district. One-half ($\frac{1}{2}$) was distributed by check in November, 1974 and the remainder in November, 1975. These funds have to be expended for highway related activities and must be spent by June 30, 1977 with notification by the community to the Department being required of said anticipated expenditure.

SECTION 3 provided for a $25 million apportionment to communities outside the MBTA district. This is money from the General Fund and can be used for any purpose the community wishes. It was a Cherry Sheet distribution for Fiscal 1976.

SECTION 4 provided for a $2.5 million apportionment to the fifty (50) "fringe" communities of the MBTA district to be used and expended in the same manner as in Section 1 above. These funds were also distributed and must be expended as is mentioned in Section 1 above.

SECTION 6 provided for a General Fund payment of $45 million directly to the MBTA to defray a portion of the MBTA assessment of the communities that make up said authority.

LOCAL TRANSPORTATION AID TOTALS

(Statewide in Millions) *Estimates

Highway Aid	1971	1972	1973	1974	1975
Local Highway and including chapters 81 & 90	10.75	10.75	13.5	13.5	13.5
One cent on gasoline tax	—	31.4	23.1	23.1	23.1
Local highway aid Non-MBTA communities	—	—	—	40.0*	45.0
Local highway aid MBTA fringe communities	—	—	—	2.5	2.5
Subtotal Highway Aid	10.75	42.15	36.6	79.1	84.1
Transit Aid					
MBTA	18.2	18.8	19.3	54.3	64.6
Non-MBTA	—	—	—	1.5*	2.0*
Subtotal Transit Aid	18.2	18.8	19.3	55.8	66.6
Total Transportation Aid	28.95	59.95	55.9	134.9	150.7
Selected Communities** (IN THOUSANDS)					
Boston	8,853.9	15,128.3	14,471.3	27,902.3	31,704.3
Worcester	178.6	1,369.7	1,983.5	2,529.4	2,526.3
Springfield	161.9	1,960.8	2,380.8	2,457.2	2,450.4
New Bedford	103.2	870.0	1,066.0	1,492.1	1,490.1
Pittsfield	72.0	448.9	665.6	957.3	955.5
Fitchburg	57.1	339.6	510.4	733.6	733.2
Lowell	84.2	694.2	847.3	1,258.3	1,259.6
Cambridge	1,172.7	1,455.5	1,441.6	3,847.3	4,347.3

**Includes Transit Aid

RIGHT OF WAY BUREAU

RELOCATION PLANNING

The Relocation Planning Section regularly works with Department Environmental Engineers, Project Expeditors, Location and Design Personnel, as well as consultants to the Department in developing highway alignment and design alternatives to advise on certain social and economics effect of the proposed facilities, including impacts on families and businesses to be displaced, employment and tax loss, effects of business displacement, possible disruption to neighborhoods and local trade, and the relocation of established families and businesses. Over 60 projects were actively worked on during Fiscal Year 1975. In addition Conceptual Stage Relocation Plans were prepared for 24 projects which could have involved the displacement of as many as 600 families and 150 businesses in the various alternatives. Right of Way Stage Relocation Plans were prepared for 8 projects and 21 Right of Way Stage Relocation Plans were developed for submission with requests for hardship acquisitions.

PROJECTS

During Fiscal Year 1975, the Right of Way Bureau Project Section worked on some 519 cases, involving about 54 cities and towns. The work that is carried out by the Project Section includes the establishment of property ownership, securing real estate tax assessments, conducting property interviews with owners and tenants, preparing property reports, and investigating complaints such as reports from abutting property owners of contamination to their wells from road construction activities.

Land and easement takings were made in connection with Interstate, ABC, Safety, Topics and Urban Systems Projects. Real Estate takings were also made with respect for maintenance sites, rest areas, drainage betterments, construction, drainage and other types of easements.

The Right of Way Project Section also monitored Right of Way acquisition by cities and towns in connection with Federally-aided Urban Systems Projects. By reviewing procedures of municipal taking agencies, it stood in the position of being able to certify to the Federal Highway Administration that acquisiton, appraisal and relocation procedures were carried out in compliance with Title II and/or Title III, Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

TITLES

As a direct result of the Highway projects for Fiscal Year 1975, it was necessary to obtain Title Examinations on 285 properties. It was further required that 478 Title Rundowns be made on properties involved in land takings.

APPRAISALS AND APPRAISAL REVIEW

During 1975 Fiscal Year, 330 Staff Appraisals were prepared and 111 Fee Appraisals secured. In addition, the lease value of State-owned land was determined on five properties. The Appraisal Review Section made 410 reviews of cases for the Right of Way Bureau during Fiscal Year 1975.

The 410 cases are broken down into the following categories: Projects, 263 cases; Advance Acquisitions, 31 cases; and Miscellaneous, 116 cases.

The miscellaneous category includes re-reviews, sales of excess land and leasing of State-owned land.

In addition economic rentals were established in 104 cases, broken down as follows: 26 single family units, 73 apartment units and 5 business units.

REAL ESTATE REVIEW BOARD

The Massachusetts Real Estate Review Board reviewed 206 appraisals and established an acquisition value on 131 properties. The Board also determined a value on 33 residential dwellings that are to be reconveyed by the

Commonwealth in Lynn and Saugus which were acquired for I-95 North and 13 properties in Boston taken for I-95 South. The five member Board also set a rental value on five parcels of land to be leased by the Commonwealth.

NEGOTIATIONS

The Negotiation Section made fair market value offers in 493 cases. This section also rendered assistance to the Land Damage Section which processed 318 payments to property owners during the Fiscal Year. In 70 cases, a final settlement was obtained from the property owners.

Furthermore, the Negotiation Section mainly by personal contact at payment sessions advised 103 owner-occupants and tenants of their Replacement Housing supplements and Rental Replacement Housing additive amounts.

In addition, the Negotiation Section was involved in the obtaining of pro tanto receipts and releases for the purpose of processing unpaid checks for payment. A total of 67 pro tanto receipts and releases were obtained during the past Fiscal Year.

The Negotiation Section also processed 30 of the 60 claims for damages incurred to structures adjoining I-93 in Somerville as the result of construction work on the highway.

RELOCATION

Replacement housing additives were computed for 90 residential owner-occupied families and Rent Supplement additives were computed for 78 residential occupants.

During Fiscal Year 1975, land takings affected 128 families and 4 businesses and in this period, 60 families were relocated and 14 businesses moved to new quarters.

There were 127 moving cost claims, both residential and business which were processed during the Fiscal Year involving a total amount of $113,955. replacement housing allowance claims totalling $293,218 (average $3,258), 78 rent supplement claims totalling $231,015 (average $2,937), and 86 dislocation allowance claims totalling $16,000 (average $190). A total of 392 business and residential relocation claims were processed in Fiscal Year 1975, and the total family and business relocation cost was $751,223.

Relocation services rendered by the Boston Redevelopment Authority and the Worcester Redevelopment Authority as Contract Agents reflected a fiscal outlay of $92,517.

Pursuant to the provisions of the 1970 Uniform Relocation Act, Right of Way personnel prepared the relocation plans at Right of Way stage for all projects which went out to bid. Under this law relocation assistance has been given very high priority and added emphasis and these legal requirements have resulted in an upgraded relocation section consisting of 25 Department relocation staff workers which, together with personnel from the Boston Redevelopment Authority and the Worcester Redevelopment Authority have ably and successfully carried out the relocation responsibilities of the Department in this period.

ADVANCE ACQUISITION and FUNCTIONAL REPLACEMENTS

The Advance Acquisition Section processed 30 cases for acquisition in the Fiscal Year just ended.

These cases included large residential tracts that had received or were to receive municipal subdivisional approval and by advance acquisition avoided the possibility of hardship to families and high acquisition costs to the public. Work on one functional replacement structure, a school was commenced in the City of Worcester. Three other parcels of vacant land and twenty-three residential

properties which were requested by the owners, were the subject of takings.

There are twenty-seven cases now pending in various stages of completion, among which are four additional requests which may involve functional replacement. The functional replacement program began during this past Fiscal Year and included a City-owned school which was acquired July, 1974, a Registry of Motor Vehicles Building, a Municipal Airport, a City-owned swimming pool and State Police Barracks. If all these cases should be approved, it could result in over $2 million of additional Federal funds being authorized for distribution to the various public agencies that own and control these facilities.

During this past Fiscal Year an estimated total amount of $1,485,500 for land damages was authorized for 34 parcels from 30 owners.

PROPERTY MANAGEMENT

Property Management activities of the Bureau were extensive during Fiscal Year 1975, as can be seen from the following figures:

During the Fiscal Year 1975, rentals under the Property Management Section of the Right of Way Bureau grossed $305,297 with a net income after expenses of $186,842.

Property Management income for the year 1975, in comparison to 1974, revealed the following:

	Fiscal 1975	Fiscal 1974
Grossed Rental Income	$305,297	$317,096
Net Income After Expenses	186,842	148,096
Sales of Structures	52,872	11,707
Sales of Land	2,800	20,500
Parking Area Leases	1,053	8,860
Additional Leases	193,263	132,100

	Fiscal 1975	Fiscal 1974
Total Net Income	$436,830	$321,264

During the year, 59 structures were acquired of which 58 were residential and 1 was commercial.

During the same year, 57 were vacated and 49 structures were released for demolition.

FHWA LIAISON

The Bureau's Federal Highway Administration Liaison and Compliance Section, during the Fiscal Year 1975, submitted documentation to support reclaims in connection with F.H.W.A, audit deductions and the Federal-Aid Pre-Audit Ineligibility Findings against appraisal and reloaction citations. This effort made it possible for the Bureau to recover $703,497 which was previously withheld by F.H.W.A.

The Bureau at the present time has submitted documentation to the F.H.W.A. that should release an additional $345,000.

ATTORNEY GENERAL LIAISON

The following represents the activities of the Attorney General Liaison Section, Right of Way Bureau, Department of Public Works, for the Fiscal Year 1975.

The number of cases requested by the Department of the Attorney General totalled 165. The number of cases completed by the Department of the Attorney General and returned to the Department totalled 125. This section provided assistance in preparation of each of these cases for trial or settlement.

Additionally, this section provided legal advisory assistance to various Divisions and Sections of the Department.

This scetion also prepared 19 legislative bills which were introduced and heard by the 1974-1975, legislature. There were approximately 55 other bills for which the section prepared written reports and appeared before legislative committee hearings on 20 bills.

TRAINING

During Fiscal Year 1975, the Right of Way Bureau's training program permitted 85 of our personnel to participate in courses of training. The breakdown is as follows:

Thirty-three (33) attended and graduated from the Right of Way Institute, Suffolk University, Boston, Massachusetts, where they participated in a Graduate Course Three in Highway Engineering, Transportation Planning and Environmental Law. Upon successful completion of this course, which was recommended by the Federal Highway Administartion (FHWA), by special notice, these 33 of our personnel were awarded the professional designation of "Real Estate Eminent Domain Analyst" by the University.

Eight (8) of our new personnel were put through the special eight week training course as required under Schedule B.

Forty-four (44) attended a special seminar given on Relocation Assistance at the Arlington District Office, which was conducted jointly with the personnel of the F.H.W.A.

OUTDOOR ADVERTISING SIGN CONTROL

The activities of this section are in compliance with the Federal Highway Beautification Act of 1965, and include the following responsibilities: Preparation of inventory of all signs located on Interstate and Federal Aid roads for determination of legal and illegal signs; preparing notices for all

illegal signs; reviewing all applications to the Outdoor Advertising Board for permits to determine if they meet F.H.W.A, criteria; and appearing at Public Hearings of the Outdoor Advertising Board regarding legality of sign locations.

As a result of the work of this section, during Fiscal Year 1975, there were 2,289 signs removed throughout the State.

In addition to the removal of signs this section has recently been given the additional responsibility to initiate a Junk Yard Screening Program throughout the State.

HIGHWAY CONSTRUCTION DIVISION

The Construction Section of the Department of Public Works supervised the inspection of an additional 77.5 miles of highway construction and related work awarded during the 1975 fiscal year. This amounted in value to more than $92,500,000.00.

The Department continues its policy of strict adherence to State and Federal Environmental and anti-pollution regulations.

Construction project accidents continue to decline in number because of the recent enactment of the Federal Safety Act (OSHA).

The Price Adjustment Clause for bituminous mixtures due to the escalation of the price of asphalt established in the Spring of 1974 is still in effect, and St. 1974, c.554 to adjust the price of liquid asphalt in contracts awarded on or before December 31, 1973 has been implemented and is fully operative.

Once again the Construction Section conducted Seminars in the District Offices to iron out any problems that might arise on projects, and to inform Construction personnel of the latest methods and procedures.

A summary of the various categories of projects follows:

	MILES	AMOUNT
Interstate	77.5	68,363,594.00
Primary, Secondary and Urban	29.0	22,710,264.39
Non Federal Aid	3.5	1,535,087.38
	110.0	92,608,945.77

PROJECTS AWARDED DURING FISCAL 1975

INTERSTATE

	I-91	
Holyoke-Easthampton-Northampton #17975	Fencing 6.2. Miles	$314,675.00
West Springfield-Holyoke #18176	Safety	36,909.00
Northampton #17973	Fencing	159,082.00
Springfield #17888	Roadside Development 6.2. Miles	89,336.35 $600,002.35
	I-93	
Medford-Reading #18329	Roadside Development 7.3 Miles	162,463.00
Reading-Methuen #17979	Safety 7.3 Miles	257,284.75 $419,747.75
	I-95	
Boston #18159	Demolition	25,997.00
Boston #18160	Demolition	32,696.75
Boston #18013	Demolition	2,399.00
Boxford-Rowley-Georgetown #18027	Reconstruction 5.7 Miles	18,748,067.40
Georgetown-Newbury-W.Newbury #18124	Reconstruction 4.1 Miles	11,566,875.00
Newburyport #18002	Reconstruction 2.8 Miles	8,836,662.40
Attleboro-Canton #18099	Call Boxes 12.6 Miles	473,866.00 $39,686,563.55
	I-190	
Leominster #18416	Resurfacing 1.7 Miles	7,066,158.00
Worcester #18044	Construction 1.0 Miles	1,457,480.00
	2.7 Miles	8,523,638.00

	I-195	
Fairhaven-Mattapoisett #18197	Roadside Development	138,026.50
Fairhaven-Mattapoisett #18269	Bridge Screening	65,080.00
Mattapoisett-Marion #17913	Roadside Development 3.4 Miles	173,740.00
Wareham #17972	Roadside Development 2.5 Miles	249,490.50
Marion-Wareham #17955	Roadside Development 5.9 Miles	228,653.00
		859,989.50
	I-290	
Shrewsbury-Boylston-Northborough-Marlborough #18407	9.3 Miles Construction	3,069,499.70
Northborough-Marlborough #17997	Fencing	162,960.00
Worcester #18340	Resurfacing 2.2 Miles	1,049,448.40
Auburn-Worcester #17974	Fencing 11.5 Miles	106,825.00
		4,388,733.10
	I-391	
Chicopee-Holyoke #18156	Demolition	4,557.00
Chicopee-Holyoke #18011	Demolition	23,822.50
		28,379.50
	I-495	
Amesbury #18263	Dredging and Riprap	38,035.00
Franklin-Bellingham-Medway-Milford #18230	Fencing	154,010.00
Marlborough-Hudson-Berlin-Bolton #18412	Fencing 5.1 Miles	180,612.50
Bolton #18410	Reconstruction 4.4 Miles	3,985,097.25
Bolton-Harvard #18411	Fencing 3.5 Miles	119,545.00

Harvard-Boxborough #18409	Reconstruction 5.0 Miles	4,308,469.25
Chelmsford-Lowell #17994	Safety	99,741.00
Chelmsford-Lowell-Tewksbury #17876	Resurfacing	1,760,553.00
Foxborough-Plainville-Wrentham #18195	Fencing 0.7 Miles	147,299.00
Wrentham-Franklin #18222	Fencing	198,544.75
Milford-Hopkinton #18268	Fencing 5.0 Miles	190,855.00
Hopkinton-Westborough #18270	Fencing 5.1 Miles	182,443.50
Westborough-Marlborough #18322	Fencing	178,062.50
Longmeadow-Bernardston #18003	Call Boxes	977,511.50
Chelmsford #17952	Resurfacing 3.5 Miles	1,335,761.00
	32.3 Miles	13,856,540.25

PRIMARY, SECONDARY & URBAN

Route 1

Attleboro-Plainville-Wrentham-Foxborough #18177	Fencing 16.0 Miles	282,324.50
North Attleborough #18318	Reconstruction 1.0 Miles	620,782.60
	17.0 Miles	903,107.10

Route 2

Gardner-Acton #18070	Safety	347,170.00
Concord #17969	Reconstruction	1,423,345.00
Ayer-Shirley #18181	Reconstruction	699,797.23
		2,470.312.23

Route 2A

Littleton #18283	Bridge Construction	933,864.35

	Route 6	
Somerset #18105	Roadside Development	103,144.20
	Route 9	
Amherst-Hadley #18221	Safety 1.5 Miles	1,617.367.20
	Route 20	
Dalton #18196	Safety	49,330.00
Lee #18157	High Hazard Location	99,229.50
Lee-Becket #17976	Safety 5.6 Miles	149,313.50
Westfield #18085	Safety 5.6 Miles	71,008.75 368,881.75
	Route 28	
Yarmouth #18332	Topics	164,519.00
Bourne #18341	Parking Area	216,225.65 380,744.65
	Route 44	
Seekonk #18337		75,767.00
Taunton #18200	Construction 1.0 Miles	1,034,175.20 1,109,942.20
	Route 52	
Auburn-Oxford #18057	Demolition	9,250.00
	Route 97	
Haverhill #17859	Traffic Control	996,257.50
	Route 110	
Methuen #17873	Drainage	9,316.00
	Route 143	
Chesterfield #18179	Demolition	985.00

	Route 202	
South Hadley #18263	Reconstruction 1.0 Miles	111,592.75
Holyoke #18356	Safety 0.6 Miles	459,624.75
	1.6 Miles	571,217.50
	Atlantic Avenue	
Boston #18232	Landscaping	104,272.00
	10 Streets	
Boston 18267	Historical Signs	17,374.00
	Bowdoin & Somerset Sts.	
Boston #18417	Reconstruction	367,992.00
	Washington & Union Sts.	
Braintree #17928	Traffic Control	436,614.00
	Washington & Walnut Sts.	
Brookline #17857	Reconstruction	394,363.45
	Everett Ave.	
Chelsea #17998	Reconstruction	82,225.00
	7 Locations	
Southbridge #17820	Topics	190,555.00
	6 Locations	
Springfield #17888	Topics	246,687.61
	Bicentennial	
Statewide #18120	Information Signs	117,628.40
	Hydro Cells	
Statewide #18198	Safety	391,700.00

	North St.	
Boston #17887	Relocation	2,009,076.00
	High Street	
Danvers #17859	Topics	692,733.45
	Bicycle Path	
Edgartown #18056	1.86 Miles	233,548.50
	15 Locations	
Fitchburg #18028	Topics	1,039,778.75
	6 Locations	
Holden #18007	Topics	466,187.50
	Medford St.	
Malden #17971	Bridge Reconstr.	977,747.00
	5 Locations	
Milford #18289	Topics	249,905.10
	14 Locations	
Needham #18012	Topics	344,794.00
	Cove Road	
New Bedford #17843	Reconstruction	345,391.50
	2 Locations	
North Andover #18312	Topics	576,579.10
	Route 125	
North Andover #18087	Pedestrian Overpass.	245,640.50
	Messenger & George Sts.	
Plainville-No.Andover #18319	Reconstruction 1.0 Miles	529,762.37

	Bicycle Path	
Oak Bluffs #18086	Construction 2.4 Miles	367,993.30
	Union Street	
Rockland #18119	High Hazard Location	60,210.50
	5 Locations	
Saugus #18257	Topics	196,392.80
	13 Locations	
Somerville #17995	Topics	549,960.00
	8 Locations	
Somerville #18072	Topics	378,875.00
	R.R. Crossings	
Districts 1 & 2 #18227	Safety	420,833.00
	R.R. Crossings	
Districts 3 & 4 #18228	Safety	476,253.66
	R.R. Crossings	
Districts 5 & 8 #18229	Safety	334,368.00
	R.R. Crossings	
Districts 6 & 7 #18226	Safety	390,433.20

NON FEDERAL AID

	10 Streets	
Auburn #18069	Sewer Repairs	47,911.64
	N.E. Expressway	
Chelsea #18321	Bridge Screening	50,550.00

	Ashley Ave.	
Chicopee-W.Springfield #17880	Bridge Reconstr.	27,540.00
	Route 22	
District 3 #18029	Catch Basin Grate Alterations	8,142.46
	Various State Highways	
District 5 #17885	Catch Basin Grate Alterations	4,590.69
	52 Locations	
District 6 #18046	Catch Basin Alterations	3,204.24
	20 Locations	
District 7 #17871	Catch Basin Alterations	4,465.50
	Route 113 & 38	
Dracut #18071	Resurfacing 2.5 Miles	394,884.00
	Route 3A	
Duxbury #18231	Safety	40,333.60
	I-195	
Somerset-Fall River-New Bedford #18021	Lighting	202,464.00
	Route 43	
Hancock #18104	Planting	24,555.00
	Route 53	
Hanover #17930	Safety 0.5 Miles	65,854.50
	Route 139	
Hanover #17997	Safety 0.3 Miles	43,583.00

	Route 2	
Lincoln #18199	Demolition	3,175.00
	Route 129	
Lynn #18180	Safety	21,850.00
	Route 27	
Brockton #17962	Traffic Control	22,969.50
	Route 18	
Abington #17917	Safety	75,188.00
	Route 132	
Barnstable #17954	Parking Area	29,955.75
	Deerfield River	
Monroe-Rowe #17879	Bridge Reconstruction	126,766.00
	Routes 202 & 122	
New Salem #18073	Safety	19,359.00
	Prospect Street	
Waltham #17953	Reconstruction 0.2 Miles	237,035.50

Contract Engineering

The Contract Engineer's Section processes the bids for Federal Aid Projects requiring F.H.W.A. concurrence, State Highway Construction Projects, Chapter 90 Projects, Maintenance Projects, Waterways Projects, Boring Projects, projects for the construction, reconstruction, alteration, remodeling, repair, or demolition of buildings under the provisions of General Laws, Chapter 149, and Right of Way Projects involving the sale of houses, and the leasing of State-owned property, from bid opening to award of contract and maintains all the necessary records thereof. The Prequalification and post-qualification of contractors is administered by this Section and the issuance of Proposal Forms and plans to prospective bidders requires the approval of this Section. Force account agreements with public utilities, cities and towns are reviewed for approval.

MAJOR ACTIVITIES

1. At bid openings all proposals are publicly opened and read subject to verification for arithmetical correctness, examination for informalities and compliance with applicable statutes.

2. After a bid opening all proposals are immediately checked for compliance with requirements. Proposals that are unacceptable due to incompleteness, irregularities, collusion, qualifying clauses, etc., are duly noted and if the deviation is a matter of substance that is prejudicial to the rights of other bidders a recommendation for rejection of such bid is made; on the other hand, a deviation may be merely a matter of form or some immaterial variation from the exact requirements that can be waived by the Commission under the right

MAJOR ACTIVITIES (CONT'D)

reserved. In the latter instance, if such bid is the lowest bid submitted, a recommendation will be made that the informality be waived and the project awarded to the low bidder as being in the best interest of the Department. After all bids have been checked and verified a "Summary of Bids" is prepared, printed and collated for distribution to interested Sections, Divisions, District of the Department, contractors who bid on the particular project, and local trade magazines and publications. Copies are retained for the Section's Records.

3. Letters recommending award or rejection are prepared and typed by this Section for the Chief Engineer's signature for presentation to the Board. Such letters are routed to our Fiscal Section for an assignment of funds. For work involving Federal funds, letters are also prepared and typed for the Chief Engineer's signature, requesting F.H.W.A. concurrence in the award or rejection of contracts as required by federal regulations.

4. Prequalification Statements submitted by contractors as required by General Laws, Chapter 29, Section 8B are analyzed, computed, and a rating determined for submission to our Prequalification Committee. Performance records of contractors who have previously performed work for this Department are maintained in this Section, and are designed to provide facts and documented data on every completed project and the contractor's performance. Such records provide a source of information for recommendations made by the Contract Engineer

MAJOR ACTIVITIES (CONT'D)

to the Prequalification Committee for the determination of Prequalification Ratings or limitations warranted by the facts.

5. For projects for which prequalification is not required, the low bidder and/or the lowest responsible bidder must submit a post-qualification statement, duly signed and sworn to, outlining his experience, equipment and financial resources on forms supplied by this Department. These post-qualifications statements are computed and analyzed exclusively by this Section and on the basis of the computation and analysis a recommendation for award or rejection is made to the Board.

6. Since the enactment of the Prequalification Statutes all requests for Proposals and Plans for bidding purposes have to be cleared and approved by this Section. This policy was adopted so as to prevent the issuance of Proposals and Plans to contractors who are ineligible to bid because of failure to meet the requirements of the Prequalification Statute and Regulations.

7. Records of all activities of this Section are maintained for purposes of documentation and source of information.

(a) A complete alphabetical file of all contractors who have performed work for this Department is kept current at all times. This file shows the location of each project which the contract has performed, the advertising date, bid opening date, bid amount, date of award, and starting and completion dates.

(b) A card index file for each project awarded, showing date of advertising, opening of bids, date of award, office

MAJOR ACTIVITIES (CONT'D)

estimate, bid price, contractor's name and address, contractor's qualification, start of construction, date of completion, extensions of time, if any, and contractor's performance record.

(c) A card file of projects awarded in each city or town, showing name of contractor, type of project, and the starting and completion date of all contracts performed within the city or town.

(d) Prequalified contractors, their prequalification rating and date of expiration.

(e) A list of "Active Bidding Contractors" who submit bids for any project for this Department each calendar year is prepared and maintained.

CONTRACT ENGINEER SECTION

PROJECTS AWARDED FOR FISCAL YEAR ENDING JUNE 30, 1975

NUMBER	CATEGORY		AMOUNT
87	FEDERAL AID	$	90,944,865.23
35	STATE HIGHWAY CONSTRUCTION		3,568,847.95
23	CHAPTER 90		4,833,830.90
293	MAINTENANCE		16,937,088.44
14	WATERWAYS		1,782,214.00
452	TOTAL	$	118,066,846.52

DURING THE FISCAL YEAR JULY 1, 1974 TO JUNE 30, 1975 A TOTAL OF 415 CONTRACTORS WERE PREQUALIFIED.

Final Review Section

The Final Review Section assumes the responsibility of assuring the Federal Highway Administration, the Department, cities and towns and the contractors that quantities for payment are correct and equitable.

The processing of projects encompasses the checking and reviewing of all field data recorded in survey books, pile driving books, manifold books and quantity control ledgers to ascertain that all calculations, engineering and accounting, are proper and correct. The interpretation of the Special Provisions as a complement to the Standard Special Provisions determines the limitation of payments for each and every project. The project checking includes the analysis of survey notes and plotting of the same in order to obtain quantities for every conceivable item of excavation as well as fill areas by mechanical means. Recently the computer has been utilized for checking these quantities when possible and has enabled this section to expedite projects with added accuracy. Projects that appear to lack the required data or may be inconsistent, necessitate a meeting with the Resident Engineer and/or his supervisor or assistants.

The initiation of pre-final teams which operate in the field at the time of the construction of said project has proven beneficial to the District, the Resident Engineer and this

Section. It makes available immediate answers resulting in quickly resolving any discrepancies which may exist. It also makes possible recommendations as to format by representatives of this Section prior to final entries.

This section is subject to audits by the Federal Highway Administration and State Auditors and the utmost cooperation is rendered them.

The following is a breakdown of the values of various types of contracts processed by the Final Review Section during the period from July 1, 1974 to June 30, 1975.

BREAKDOWN VALUE OF CONTRACTS PROCESSED BY THE FINAL REVIEW SECTION

VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS:	
HAVING FEDERAL AID PARTICIPATION	
State Highway Construction	$58,980,416.27
Maintenance	103,466.07
VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS:	
NON-FEDERAL AID	$ 6,438,982.49
VALUE OF STATE AID (Chapter 90) CONTRACTS:	$ 4,641,253.37
VALUE OF MAINTENANCE CONTRACTS:	$17,053,420.73
VALUE OF MISCELLANEOUS CONTRACTS:	$ 231,769.15
(Includes Consultant Services, Boring Contracts, Boston - (P.W.B. Contracts), Traffic, etc.)	
Total =	$87,449,308.08

NOTE:
Not included in the above totals are thirteen (13) Federal Estimates (Final Federal Aid Vouchers) which were submitted during the period of July 1974 through June 1975

HIGHWAY MAINTENANCE DIVISION

Physical maintenance consists of preservation and restoration of the highway and its attendant facilities. Betterments include improvements and additions to the highway as originally constructed. Physical maintenance and betterment projects are carried out both by using Department forces and by contract.

The Maintenance Section in the Fiscal Year 1975 completed 341 contracts for various types of work such as roadside maintenance, traffic maintenance, snow and ice control, bridge and highway maintenance.

No funds were appropriated for the regular resurfacing account for Fiscal Year 1975. However, $7,000,000.00 was expended from the Accelerated Highway Program. A total of fifty one (51) contracts were awarded during the year for the resurfacing of approximately one hundred and ten (110) miles of highway with Class I Bituminous Concrete Type I-1, varying in widths from 24 feet to over 60 feet and varying in depth from 3/4" to 3".

The Permit Unit issued some 19,981 permits for the movement of heavy equipment, house trailers, buildings and other irreducible loads, for 302 utilities installations and 100 driveway construction permits.

The Maps and Statistics Unit of the Maintenance Section maintained and continually updated maps, charts, and statistical records relative to the operation of the state highway system in Massachusetts.

Activities carried out under Roadside Maintenance included the removal of dead, diseased and dangerous trees, mist blower spraying, soil sterilant spraying, tree planting, tree trimming, travel trash collection, mowing of grass, roadside spraying and fertilization, drainage ditch spraying, tree planting for erosion control, selective clearing for safety and sight distance and plant fertilization. Normal force account work such as vista clearing, selective clearing and trimming, brush control for safe sight distance, emergency tree removal and trimming along with costly litter pick up, rest area and truck turnout improvement and drainage ditch clearance were carried out in all Districts.

As of July 1, 1975 the Structures Maintenance Unit had responsibility for a total of 2,313 bridges. The cleaning and painting of bridges was one of the most important operations. During Fiscal Year 1975 contracts were awarded for the cleaning and painting of 11 bridges at a total cost of $522,755.00.

The Underwater Bridge Inspection Team has proven to be a useful adjunct to the Maintenance Section in meeting the Department's legislated obligation of inspecting all bridges on the Federal Aid System at least once every two years. Approximately 80 underwater bridge inspections have been conducted. The services of the team are available to all units in the Department. Routine, preliminary and final inspections have been made for the Waterways Division, Bridge Section, Construction Section and Survey Section.

There have been some rather revolutionary life saving devices introduced in the past few years. These safety devices were taken advantage of by the Traffic Maintenance Unit and they included breakaway sign supports, impact attenuation devices, rapid curing pavement markings, optically programmed signals and new design standards.

The budgetary allotment for pavement markings maintenance for fiscal 1975 was increased $300,000.00 over fiscal 1974 for a total of $1,135,000.00 to purchase materials and to do contract maintenance work. In effect, this money allowed the Department to purchase striping. This funding, although not enough to apply material to every stripe requiring it, was responsible and did provide for an adequate striping program for fiscal 1975.

During the 1975 Fiscal Year, the Department Snow & Ice Control forces plowed and treated 11,438 lane miles of state highway. The program for providing industrially pre-mixed sodium and calcium chloride was continued again this year. Also the construction of Chemical Storage Sheds was continued with an appropriation of another $300,000.00 from the Legislature. A proposal was advertised for the contract construction of thirteen (13) sheds varying in length from sixty (60) to ninety six (96) feet, each being forty (40) feet in width. Last winter can best be characterized as moderate, but the almost continuous sequence of smaller storms (58 average statewide), with a high frequency of freezing and thawing cycles, plagued the highway crews and motorists. Storms caused no extensive tie-ups but were of the size and low-temperature variety that required a high personnel work outlay, and must be classified as expensive.

BUREAU OF TRAFFIC OPERATIONS

The role of Traffic Engineering in the safe and efficient operation of our state and local highway systems today is highly significant. Traffic control and safety devices have proven themselves a necessary adjunct to the modern highway.

Bureau operations and priorities were profoundly influenced by the economic climate in Fiscal 1975 with the Bureau's focus being shifted to conservation of monetary and energy resources. Principal areas receiving attention were speed regulation, highway lighting, motorist communications and peripheral programs.

The Department's lighting section has initiated a program of energy conservation by lamp type replacement. Mercury vapor lamps in existing lighting systems have been and are continuing to be, replaced with high pressure sodium vapor lamps. The savings in energy has been approximately thirty-seven percent (37%) over the average life of each lamp. This factor multiplied by the life of each lighting system yields a significant savings and has justified introduction of this lamp type.

The Speed Regulation Unit has, for the past year, had the responsibility of monitoring vehicular speeds on our state highways both for the Department and Federal Highway Administration. The purpose of the study has been to ascertain the average speed, median speed, and 85th percentile speed of motorists. The study also indicates the percent of motorists exceeding 55, 60 and 65 miles per hour. A report will be submitted quarterly to the F.H.W.A.

The basic purpose for the speed reduction to 55 miles per hour has been to reduce oil products consumption. Another benefit has been a reduction in accidents over the period of specific enforcement. Significant progress was made in the design and installation of Motorists Aid Call Box Systems. Installation of the Route I-93 and Route I-91 Systems was begun during Fiscal 1975 along with Routes I-495 from Foxborough to Milford and I-95 from Attleboro to Canton.

These four systems, when completed, will bring the total Motorist Aid Call Box System mileage on our Interstate Highways, to an aggregate of 200 miles.

During Fiscal 1975 the TOPICS Unit, using Urban System funds, submitted 173 Area-wide work programs and budgets. There have been 275 requests for field topographic surveys for new projects submitted along with 125 - 75% preliminary project design plans. Plans, Estimates and Special Provisions have been prepared for 104 projects with a construction dollar volume of $46,000,000.

The Traffic Signal Section processed 75 federally aided signal layouts and 225 signal layouts for cities and towns.

During Fiscal 1975 the main workload of the Traffic Engineering Signs and Pavement Markings Unit was channeled in four specific areas - Signing, Pavement Markings, Standards and Specifications and Route Changes and Descriptions.

The Sign Unit has the continuing responsibility of reviewing the signing for Department (Highway Design) and consultant projects along with the implementation of our own sign projects. This past year the unit reviewed twenty (20) advertised interstate and state highway contracts containing approximately $4,000,000 in signing. The unit also reviewed signing for forty (40) Safety Improvement (High Hazard Location) projects advertised during Fiscal 1975.

Three special sign projects - The Street Name Sign Program, the Massachusetts Information Signs in Roadside Rest Areas and the Installation of Traffic Control Devices at Railroad Crossings have also been undertaken by this unit.

The primary objective of the Street Name Sign Program is the prevention of accidents by providing concise and adequate signing at street intersections for the stranger in order that he may readily find his desired destination without causing disruptions in the traffic stream. It was implemented in November, 1974 with Phase I of a two phase program. It was intended that forty-six (46) cities and towns within the Route 128 periphery plus eleven (11) cities and towns chosen by the Bicentennial Commission outside Route 128 would participate in this program. However, only thirty-three (33) cities and towns responded and as a result the Department supplied 10,103 street name signs. The signs were installed by local forces on those numbered routes within the community.

The Massachusetts Information Signs in Rest Areas program was initially slated to be the Department's contribution to the Bicentennial celebration. This consists of erecting special porcelain-enamel steel information maps in roadside areas across the Commonwealth. Its main purpose is to increase operational efficiency and improve safety by directing tourists to their destination without causing disruption in the traffic stream.

The installation of Traffic Control Devices at Railroad Crossings consists of the application of white and yellow reflectorized pavement markings and the installation of warning and regulatory signs at nine hundred and seventy-six (976) railroad crossings statewide under four separate contracts each containing two Districts. The funding for this project is under Section 203 (Rail-Highway Crossings) and Section 230 (Federal-Aid Safer Roads Demonstration Program) of the Highway Safety Act of 1973. Cost for this project totaled $1,665,687.80.

During the past year the Pavement Markings Sub-Unit has reviewed a multitude of projects designed by consultants and Department personnel. These were designed according to the latest standards set forth by Massachusetts Manual on Uniform Traffic Control Devices for Streets and Highways. Thermoplastic markings are being used where traffic volumes warrant them.

The Sign Unit submits to the Federal Highway Administration in Washington, D.C. new concepts and prototypes in signing for

acceptance by the National Joint Committee. This past year two submissions were made. The first was the use of a new graphic sign for the exclusion of pedestrians, bicycles and horses from limited access highways. One sign incorporating three symbols of a person, bicycle and horse with a red circle and red diagonal slash superimposed on them. The second submission was a graphic Bus Stop sign containing the symbol of a bus, a large "T" and round top. To date these submissions are pending review by the National Joint Committee.

The Operations and Safety Unit performed geometric reviews, traffic analyses, inspection of traffic controls and devices through construction projects, processing Chapter 90-33B projects and in maintaining the Department's accident records system. A recent innovation in the Accident Records System is the capability of producing collision diagrams on a computer controlled plotter for all State Highway intersections.

Funds provided by Section 205, under the Highway Act of 1973 have been completely obligated for pavement marking on highways which are on and off the Federal Aid System. To date approximately 300 miles of highways have been marked under this program.

The Department has determined, under Section 210 of the Act that the replacement of conventional fixed sign supports with the safer breakaway type is of the highest priority in the effort to eliminate roadside obstacles. Last year a contract for approximately one and one-half million dollars was let to remove fixed sign supports on state highways. An equal amount of funds are expected to be obligated this year.

Since Section 230 encompasses all of the aforementioned programs, but differs in that funding is eligible only for highways which are not on the Federal-Aid System, the type of work done is quite varied. Under Section 230 several projects are presently being designed by cities and towns for funding.

The Bureau of Traffic Operations administers three (3) of the eighteen (18) Highway Safety Standards which comprise the Governor's Highway Safety Program. Examples of accomplishments under these standards are as follows:

A. Utilizing funds provided by Standard 609 the Department hired an additional engineer to aid in administering Federal-Aid Programs such as the Highway Safety Act of 1973.

B. The Department's Photologging Unit is also funded through through this standard. To date photologging has proven to be highly valuable in locating roadside obstacles and examining accident locations.

Standard 612 has enabled the Department to continue programs of Bridge Inspection and Skid-Accident Reduction. Through Standard 612, funds are made available to train personnel and purchase needed equipment for these safety programs.

Through Standard 613, Department engineers have attended short training courses aimed at increasing their knowledge and their value to the Department. This standard also enables qualifying cities and towns to purchase pavement marking equipment,

traffic counters and warning regulatory signs for use on highways that are not on the Federal-Aid System.

RESEARCH & MATERIALS SECTION

The Research and Materials Division has its headquarters in Wellesley and is responsible for a wide variety of physical research projects and for complex materials testing.

MATERIALS TESTING SECTION

One of the Division's major components is the laboratory. For testing and detailed analysis purposes, this is divided into four units, as noted:

1. Bituminous: quality control of asphalt and bituminous concrete mixes, and testing and evaluation of new products.
2. Chemical: paint, chlorides, pesticides, adhesives and many other products are analyzed.
3. Concrete: Portland cement and concrete are tested, as well as reinforcing steel, brick, pipe and fencing materials.
4. Soils: earth materials - gravel, sand, peat, loam, etc. are analyzed.

BITUMINOUS UNIT

The Bituminous Unit's test procedures and equipment, as in the past years, met the requirements of the AASHTO Materials Reference Laboratory periodic inspection. Due to the lack of sufficient personnel, the amount of testing had to be curtailed to a "spot check" method which enabled us to test over 1000 samples during the past fiscal year.

CONCRETE UNIT

The total number of samples tested in the 1974-75 fiscal year was 6,000. This represents a decrease in previous years but the complexity of the tests has increased the time required in the testing of many of the items.

CHEMICAL UNIT

The total number of samples tested by this unit in the past fiscal year was approximately 1,700. In addition, a bridge deck evaluation and inspection unit operates out of the Chemical Unit. It's responsibilities consist of training and assisting district teams in the areas of bridge deck corrosion, chloride content and membrane evaluation.

SOILS UNIT

Samples tested for Department and related organizations amount to about 600. This unit follows all AASHTO Test Procedures to make sure that the Department receives specification materials for its highway construction and maintenance projects.

FIELD MATERIALS CONTROL SECTION

The Field Materials Control Section has the responsibility for the monitoring of the plants which manufacture products used in highway building. There are more than two hundred bituminous concrete and cement concrete in the State which, at one time or another, service Department projects. Their manufacturing

equipment techniques and controls must be approved by this Unit.

All other manufacturing plants, such as steel, prestressed concrete, pipe, catch basin and manhole block companies must also be inspected and their products approved on a regular basis.

In addition to their plant monitoring, the Unit is responsible for all progress record sampling on construction projects (188 of them in 1975), and is also charged with detailed review of materials documentation on these projects.

SOILS AND FOUNDATION SECTION

TEST BORINGS AND SEISMIC SURVEY

Two advertised contracts were done in Fiscal 1975, both on Route I-190, one a design study in Worcester-W. Boylston and the other a pilot program in the towns of W. Boylston, Sterling and Holden. There were approximately 90 borings on the Route I-190 interchange and 55 on the pilot study.

The Department's two open-end boring contracts had twenty-three projects, Districts 1,2 and 3 had 10 projects and District 4 thru 8 had 13 projects.

The Department's test boring crew had 15 projects in Fiscal 1975. District 1,2 and 3 had 6 projects and Districts 4 and 8 had 9 projects. There was one seismic survey in the City of Haverhill completed in 1975 for the Solid Waste Bureau.

Design Bearing Ratio was obtained for 8 projects throughout the State. Sub-grade materials were tested by the California Bearing Ratio Method to obtain a Design Bearing Ratio which is used by the Pavement Design Engineer to determine the pavement requirements for the Department's layered pavement design.

Some of the projects were of considerable length, such as the Mid-Cape Highway Project which was some 29 miles and the I-195 project from the Rhode Island line to the Braga Bridge, some 11 miles±.

SOILS ENGINEERING, RESEARCH AND FIELD INSTRUMENTATION

This unit continues to review the technical aspects of all soil reports submitted for proposed Department work to ascertain that the designs and construction methods are in the best interest of the Department. This often involves a site visit, and where special problems occur, is followed up by construction inspection.

This unit, being the Department's Technical Representative on continuing cooperative soil related research projects, reviews the progress of such projects and has continous communications with the researchers.

MATERIALS SECTION

Approximately 45 construction projects were visited by the Embankment and Soils Field Control Engineer to check on material incorporated in construction embankments. The Nuclear Density

Gauge continues to be a valuable piece of equipment in determining density and moisture content for soil as well as for bituminous concrete. With the introduction of manufactured crushed stone and dense graded crushed stone for sub-base, the Nuclear Density Gauge had become an invaluable piece of equipment to measure density and compactive effort.

SKID TESTING

During the 1975 fiscal year our Skid Testing program was continued in three separate phases.

First, an inventory program was set up to test and catalog the entire state highway system, with the interstate highway system receiving first priority to be followed by the primary and secondary roadways. A total of 750 lane miles of interstate highways were tested. This constitutes approximately 45% of the entire interstate system (not including the Massachusetts Turnpike).

Second, a research program entitled "Effectiveness of Alternate Skid Reduction Measures" was continued in conjunction with Mid-west Research Institute of Kansas City, Missouri, and in cooperation with the Federal Highway Administration. The project consisted of a before-and-after study of thirty highway sections in Massachusetts to determine the relationship between accident rate and skid number. A total of 375 lane miles of primary and interstate highways were tested. A complete report on the first

phase was compiled and distributed to the appropriate agencies. Phase two of this program was started during this fiscal year, and is due to be completed during the following year.

The third phase of our skid testing program consisted of carrying out a continuous program of testing high wet accident areas on request. Shortly after construction, the skid resistance of new and/or experimental pavements wherever placed are measured with periodic remeasuring in order to monitor the change in skid resistance and to evaluate the mix designs, wearing qualities of various aggregates, etc. Approximately 200 lane miles of primary highways were tested on this basis.

RESEARCH UNIT

During the past fiscal year the Research Unit was responsible for the supervision of eleven studies under the Highway Research Program which is financed in part by the Federal Highway Administration. In addition to these we continued three other studies. Two of the studies were on a 50-50 basis with the U.S. Geological Survey; one of these is the Geologic study and the other is the Water Resources study. The Joint Highway Research Study in collaboration with the Massachusetts Institute of Technology was continued with financing entirely by the Massachusetts Department of Public Works.

The following is a list of the Highway Research Program studies which were active during fiscal 1975.

Study No.	Title	Research Agency
R5-5	Roadside Development	University of Massachusetts
R9-0	Hydrologic Study-Small Watersheds	U.S. Geological Survey
R12-2	Movement & Stability of Cuts & Fills	Massachusetts Institute of Technology
R12-7	Evaluation of Rapid Frost Susceptibility Test for Soils	Massachusetts Department of Public Works, Research & Materials Division
R18-0	Effects of Deicing Chemicals Upon Surface and Ground Water	U.S. Geological Survey, & Massachusetts Department of Public Works
R21-3	Reduction in Negative Skin Friction	Massachusetts Institute of Technology
R23-0	Behavior of Varved Clays in Civil Engineering Structures	Massachusetts Institute of Technology
R27-0	Surface Characteristics of Pavements	Massachusetts Department of Public Works, Research & Materials Division
R30-0	Evaluation of Bridge Patching Materials	Massachusetts Department of Public Works, Research & Materials Division

PROCEDURES & RECORDS SECTION

THIS SECTION IS RESPONSIBLE FOR THE CONTINUOUS, COMPREHENSIVE AND SYSTEMATIC REVIEW OF THE RECORDS, POLICIES AND PROCEDURES RELATING TO THE TECHNICAL OPERATIONS PERFORMED BY ORGANIZATIONS REPORTING TO THE CHIEF ENGINEER.

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I. MAJOR ACTIVITIES

A. Project Reviews

1) Construction Reviews - Engineering Teams from this Section conducted approximately one-hundred and five (105) In-depth Reviews of active Highway and Bridge Construction projects throughout the State. A circumspect review and audit of all records relating to documentation for pay quantities and control of materials & equipment incorporated into the project is conducted to assure that project is in compliance with Contract Specifications, Department Standard Operating Procedures and other controls; also to render assistance where required. This phase of the review is followed by a field inspection in company with the Resident Engineer, of work completed and in progress. Various construction operations underway are observed to assure that accepted practices and controls are being maintained by State personnel and the Contractor. Where applicable, check measurements are taken to ascertain conformance with Specifications. In addition, the Contractor's overall compliance with OSHA (Occupational Safety & Health Act) requirements are evaluated together with measures taken to provide protection to the traveling public. Detailed reports of these reviews are prepared together with any recommendations and submitted directly to the Chief Engineer, with copies distributed to Research & Materials Division, Construction Office, the respective District and to the Division Office of the Federal Highway Administration.

I. MAJOR ACTIVITIES (cont)

2. EEO Reviews - Equal Employment Opportunity Contract Provision compliance has been monitored through the Procedures & Records Engineer (as the designated EEO Coordinator for the Department) and the Section's EEO Unit (EEO Administrator and Assistants). This review procedure, like that of the Construction Reviews, is implemented throughout the duration of each Federal Aid Construction Project, and specifically included:

a) 42 On-Site EEO Project Compliance Reviews
b) 7 Joint FHWA Project Compliance Reviews
c) 7 Home Office EEO Compliance Reviews
d) 102 Preconstruction Conferences
e) 23 Post Preconstruction Conferences

The reviews were conducted both independently and in conjunction with personnel of the Division and Regional Offices of the Federal Highway Administration. Reports and evaluations are submitted directly to the Chief Engineer, the District Office and to the Division Office of the Federal Highway Administration.

B. Statistical Reports - The Section has assumed the responsibility for compiling and processing the substantially increased work load of statistical reporting requirements of the Department, principally in the area of Civil Rights and EEO. Among these are the following:

1. PR-1391 - Contractor's Monthly EEO Reports
2. PR-1392 - Annual Summary of Contractor's Work Force for month of July (Statewide)
3. FHWA-1409 - Contractor's Quarterly Training Report (each trainee)
4. FHWA-1410 - Summary of all Trainees (Statewide)
5. Optional Form 66 - Office of Federal Contract Compliance-Monthly Manpower Utilization Report

I. MAJOR ACTIVITIES

B. Statistical Reports (cont)

6. Contracting Activity Report - Monthly listing of projects advertised and awarded in Bid Condition Areas. Assignment of OFCC Number (e.g. BO-DOT(H)-7-74-006; NB-DOT(H)-7-74-007)

7. Post Contract Implementation Report - Summary of all Optional Form 66 Reports for each Contractor, Project and Trade utilized including subcontractors.

8. DOT Quarterly Report - A report submitted to FHWA Division Engineer on Project and/or Home Office Reviews conducted during preceding quarter and a schedule of reviews for next quarter.

9. Youth Opportunity Program - Again, the Section prepared and distributed correspondence soliciting Contractors and Consultants to provide employment for disadvantaged youths in the Highway Industry. As requested by the FHWA, a final report was submitted listing certain statistical information secured from a survey of participating companies conducted by this Section.

C. Civil Rights - Title VI Guidelines - The overall responsibility for initiating and monitoring Title VI (1964 Civil Rights Act as amended) activities has been assigned to the Procedures & Records Engineer and the Section. Guidelines were developed and submitted to the FHWA to provide for implementation of procedures to assure compliance by the various Divisions and Sections of the Department for which Federal Financial Assistance is received. The Section is responsible for monitoring the compliance with these Guidelines in conjunction with the designated Civil Rights Officer in each of the nine (9) Federal Aid Program Areas. Responsibility for submission of an annual summary report of compliance will be that of the Procedures & Records Section. Three (3) In-depth Reviews were conducted jointly with the Federal Highway Administration:

1. Planning
2. Research & Materials
3. Design

I. MAJOR ACTIVITIES

D. Standard Operating Procedures - Procedures & Records Section has continued to review all proposed new or revised Standard Operating Procedures concerning engineering or technical operations of the Department. Where necessary, investigations were conducted to provide clarification of procedures or enunciation of policy.

P&R Section representatives were on the Committee regarding proposed Reorganization of the Department and have been assigned the responsibility for review of all Standard Operating Procedures which will require changes due to proposed Reorganization.

E. Action Plan - During the first half of Fiscal '74, an engineer from this Section was assigned to full time work in the preparation of the Massachusetts Action Plan. Following the preparation, final printing and distribution of the Plan, a Section representative was assigned to prepare guidelines for implementation of the Plan in conjunction with the Federal Highway Administration.

II. SPECIAL ASSIGNMENTS

In several areas, this Section has been involved on a continuous basis for special assignments:

A. Personnel have investigated problem areas and resolved questions thus expediting Federal reimbursement.

B. Construction Safety - Occupational Safety & Health Act (OSHA) regulations are featured prominently in Construction Project Reviews and the Section has maintained close liaison with the Division of Industrial Safety, Massachusetts Department of Labor & Industries.

C. Construction Seminars - The Procedures & Records Engineer and other personnel of the Section participated in the annual meetings with field personnel in the Districts throughout the State.

III. LIAISON WITH OUTSIDE AGENCIES

A. Federal Highway Administration - In addition to formal contact with the FHWA Division Office, personnel of this Section have participated in Seminars and Workshops conducted at the Regional and National level.

B. AASHTO & AHONAS (NASHTO) - The Procedures & Records Engineer has been an active delegate to these organizations of State Highway Officials. The Section coordinated efforts to schedule the National Convention of AASHTO for Boston in 1976.

C. Other States - Acting as liaison for the Chief Engineer and Commissioner, this Section has prepared replies to general and specific inquiries from sister States.

D. Other Departments, Agencies - Via meetings and correspondence, the Section has maintained liaison with the Department of Labor & Industries; Department of Natural Resources; Massachusetts Commission Against Discrimination; and Division of Administration & Finance.

Notable efforts have been expended in behalf of the State Office of Minority Business Assistance. Of special note, was the preparation of Contract Special Provisions for 'Minority Subcontractors'.

E. Contractor Organizations - A productive relationship of mutual benefit has been maintained with CIM (Construction Industry of Massachusetts) and AGC (Associated General Contractors).

F. Unions - A cordial relationship with Highway Industry Trade Unions through meetings and correspondence has reduced much tension relative to Equal Employment Opportunity.

IV. LIAISON WITH OUTSIDE AGENCIES (cont)

G. Minority Organizations - Civil Rights and EEO duties have involved the Section with minority organizations throughout the State. The Section has developed, and is monitoring a Contract for Supportive Services for On-the-Job Trainees with the New Bedford Urban Coalition and extension of contract by means of a new contract. In addition, two (2) more Supportive Services Contracts have been executed with the Community Minority Cultural Center of Lynn and the Greater Lawrence Community Action Council, Inc., to provide services for On-the-Job Trainees in the North Shore Area.

H. Training - The Procedures & Records Engineer has been actively involved with development of a Department In-House Training Program.

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DATA PROCESSING SECTION

During the past year the data processing section has upgraded computer hardware from an IBM 370/145 with 256K memory to 512K. At the same time the disk storage capability was increased by converting from IBM 2319 drives to IBM 3340 drives to accommodate increased workloads both in-house and as service to other agencies. These increases were accomplished with no additional expenditure by taking advantage of fixed pricing plans and eliminating the additional billable charges which we were paying previously.

Remote terminal service is still being provided during the normal work day to all eight district offices, highway planning and the M.D.C. A high speed terminal has been installed at the office of the Central Transportation Planning Staff and another is proposed for the Water Pollution Control Board so that direct entry to our central facility from these groups is, or will be, provided on a continuing basis.

The payroll system has been partially revised during the year, so that paper checks with a stub showing deductions are now being used. A computer tape with the check issue information is provided to the bank to facilitate the reconciliation as checks are cashed.

Our plotter is in full use, providing plans, graphs and charts for our own department and also to various other agencies. The Traffic Signal Inventory is in partial operation with work progressing to make it a complete system.

Basic system design and equipment testing has been completed to provide an automatic system for the collection of fuel use data, replacing our current method which relies heavily on manual coding and data entry. The full system should be in operation very soon.

Computer use for the fiscal year, based on the main processing unit meter, totaled 2722.63 hours. The four-month total with 256 K memory and smaller disks totaled 1052 hours for an average of 263 hours a month. With new disks and 512 K main memory the total was 1670.63 hours or an average of 208.83 hours a month, with a greater work load. Actual wall clock time would be over 300 hours a month; in order to reach full capacity or about 700 hours a month it would be necessary to operate three shifts around the clock, seven days a week. This would require additional staffing.

DIVISION OF WATERWAYS

The Division of Waterways as specified under Chapter 821 of the Acts of 1963 is a separate Division within the Department of Public Works. Its duties the functions are separate from the Highway Division of the Department and are outlined in Chapter 91 of the General Laws. In addition to the duties and functions as outlined in Chapter 91 of the General Laws, the legislature by means of special legislative acts and resolves, authorizes and directs the Department of Public Works through its Division of Waterways to perform functions that are beyond the scope of Chapter 91.

A list of the chief functions and responsibilities of the Division of Waterways follows:

UNDER CHAPTER 91

1. The design and supervision of construction of shore protection, harbor improvement and development, stream clearance and flood control projects throughout the Commonwealth. Design is performed either with the Division's own staff or by consulting engineers. Supervision of construction is with our own staff.
2. Issues licenses for structures in certain rivers, tidewaters and great ponds; and permits for dredging. All licenses and permits are issued after a public hearing has been held.

3. Makes field inspections to see that work for which licenses or permits have been granted comply with plans.
4. In charge of great ponds (over 1300), Commonwealth tide lands, rights in land, flats, shore and tidewaters (over 1900 miles of tidal shore).
5. Acts as the coordinating agency for Federal harbor development and shore protection projects done on a cooperative basis (i.e., in some cases only fiscal cooperation and in other cases both fiscal and engineering cooperation).
6. In charge of the State Piers at Plymouth and New Bedford and Pilgrim Memorial Park in Plymouth (Plymouth Rock and surrounding area).
7. Leases Fall River and Gloucester State Piers. Makes certain repairs and reconstruction to said piers as authroized by Special legislation.

UNDER SPECIAL LEGISLATION

1. Acts as the contracting agent for the Public Access Board. As such represents the Commissioner of Public Works at meetings of the Board. Designs and supervises construction of public boat launching sites approved by the Public Access Board.
2. Acts as the contracting agent for the Department of Natural Resources for the design and construction of recreational facilities such as swimming pools and skating rinks outside the Metropolitan District Commission.

3. Under Chapter 595 of the Acts of 1970, the duties of the County Commissioners relative to the construction, supervision and maintenance of dams and reservoirs were transferred to the Commissioner of Public Works, who has assigned the duties to the Division of Waterways. The Division is receiving assistance from the Highway Districts, who have assigned personnel to make inspections and prepare reports.
4. The Division in cooperation with the Massachusetts Port Authority; the U.S. Coast Guard; U.S. Army Corps of Engineers; the Mass. Department of Public Health; the Attorney General's Office; and the Boston Harbor Committee on Pollution, is preparing a program aimed toward cleaning up navigational, health, and safety hazards in Boston Harbor and other coastal waters.
5. Under Chapter 870 of the Acts of 1970, a special fund was created to be known as the "the Harbors and Inland Waters Maintenance Fund."

The work to be done from the monies in this fund consists of the continuous maintenance, dredging, and cleaning of the harbors, inland waters and great ponds of the Commonwealth in order to protect the wetlands of the Commonwealth.

6. The Division of Waterways is the representative for the Commissioner on the following commissions and boards:

    1. Water Resources Commission meets Monthly
    2. Public Access Board meets Monthly
    3. Connecticut River Flood Control Commission meets Quarterly
    4. Thames River Flood Control Commission meets Bi-Annual
    5. Merrimac River Flood Control Commission meets Bi-Annual

ANNUAL RIVERS AND HARBORS HEARING

At the Annual Division of Waterways Rivers and Harbors Hearing held April 24, 1975 the Division heard petitions from 57 municipalities for 141 proposed projects to be done under the provisions of Chapter 91 of the General Laws.

Sixteen (16) cities petitioned for 40 projects and forty-one (41) towns petitioned for 101 projects.

These projects will be scheduled for implementation on a priority basis as determined by the Commonwealth and the City or Town Officials.

The order of priority will depend on the availability of local and state funds and engineering resources.

WATER CONTROL STRUCTURE

Under the provisions of Chapter 91 of the General Laws and Chapter 727 of the Acts of 1970, the Department was authorized by the Legislature to cooperate with the Town of Wellfleet on a water control structure at Chequesset Neck Road over Herring River.

The Division directed Andrew Christo Consulting Engineers to prepare plans and specifications for the work consisting of a three barrel reinforced culvert for a water control structure, tide gates, sluice gate, concrete wingwalls, lumber sheeting, dike construction, slope and channel paving, grading, roadway construction and miscellaneous work.

The construction work was awarded to the low bidder Van D. Lambert Excavating Inc. on February 13, 1974 and the project was completed April 14, 1975 at a total cost of $239,770.00.

The Town of Wellfleet contributed 50% of the total cost.

SHORE PROTECTION PROJECT

Under the provisions of Chapter 91 of the General Laws and Chapter 822 of the Acts of 1973, the City of Quincy petitioned the Department for a Precast Concrete Block Seawall at Town River Bay from Palmer Street to Baker Beach.

Plans and specifications were prepared by the Division and the project was awarded to Ernest Minelli, Inc. on September 4, 1974.

LICENSE & PERMIT SECTION

The Division, during Fiscal 1975, held numerous public hearings for petitions under the provisions of Chapter 91, for structures in, over and under tidewaters, Great Ponds and certain streams and for excavation or dredging in same. As a result of these public hearings, approximately 130 licenses and ten (10) permits were granted. There has been a substantial reduction of licenses issued as a result of Environmental Assessment requirements of which about eighty (80) are now awaiting replies.

Approximately $16,000.00 was received for fees for tidewater displacement and for privileges granted under licenses in the Commonwealth Tidelands.

The Division made four hundred (400) field inspections to see that work done complies with the license or permit and also on complaints of unlicensed work.

The Division, under the provisions of Chapter 130, Section 27A and of Chapter 131, Section 40 of the General Laws as revised by Chapter 818 Acts of 1974 (the so-called Jones and Hatch Acts), receives notices from persons planning to fill or dredge in coastal or inland waters. The Division's function is to determine what jurisdiction, if any, comes under the provisions of Chapter 91 of the General Laws. Approximately 400 to 500 such notices are received annually.

The Division has reviewed 59 Land Court Cases this year for the purpose of protecting the rights of the public in tidewaters and Great Ponds.

The work was started on November 11, 1974 and completed on May 15, 1975 at a total cost of $38,856.80.

The City of Quincy contributed 50% of the total cost.

HARBOR IMPROVEMENTS-REMOVAL AND DISPOSAL OF EXISTING STRUCTURES

Under the provisions of Chapter 91 of the General Laws and Chapter 878 of the Acts of 1970, the Department was authorized by the Legislature to undertake a major Harbor and Inland Waters Improvement Program.

Under this program, in cooperation with the Department of Natural Resources, the Division completed a harbor improvement project at Gallops Island consisting of the removal and disposal of an existing timber pier, bulkhead, and removal and disposal of three (3) sunken barges.

Fairhaven Marine, Inc. began on this project January 23, 1975 and completed the Contract on May 21, 1975 at a total cost of $84,500.00.

BUREAU OF SOLID WASTE DISPOSAL

Fiscal year 1975 was a major milestone for the Bureau of Solid Waste Disposal. The reorganization of state government marked Fiscal 1975 as the final year for the Bureau of Solid Waste Disposal in the Department of Public Works. Effective July 1, 1975, the Bureau will be in the Department of Environmental Affairs.

It is appropriate in our last DPW annual report to take specific notice of and express the Bureau's appreciation for the assistance provided by the numerous individuals and offices in the DPW that have worked with the Bureau providing such indispensible support as budget and fiscal management, engineering and technical support, and the full range of administrative support including mail, motor pool, legislation, contracts, policy, personnel, etc.

It is also appropriate to note that while our need for direct administrative support from DPW no longer exists, the need for continuing cooperation between Envirnomental Management and Public Works is an important part of the state solid waste program.

During Fiscal year 1975 the primary emphasis of the activities of the Bureau was the implementation of a statewide network of regional solid waste disposal resource recovery systems. The first effort in the implementation of this program is ongoing in the Northeastern sector of Massachusetts, centered in the

Merrimack Valley. The Bureau is working with a group of municipalities through a voluntary participation arrangement to plan and implement a long term solution to the area's solid waste problems. The Bureau has assisted local officials in the evaluation of facility sites, the design of regional approaches and the solicitation and selection of proposals from a private industrial firm to design, construct and operate a solid waste disposal resource recovery facility. Such a facility would be capable of processing municipal solid waste from a large number of municipalities in the region and recovering valuable energy and material by-products from the wastes.

Work has also commenced in the organization of a second regional system in the west suburban area of Boston. A number of municipalities in this area have expressed a willingness to work with the Bureau to implement a regional system. It is anticipated that implementation of similar regional systems will be undertaken in the near future in areas such as Worcester County, the Connecticut Valley area, Southeastern Massachusetts and other areas.